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EFFECTS OF MULTIMODAL APPROACHES OF PROVIDING ACADEMIC COUNSELING FEEDBACK ON COUNSELING OUTCOMES USING THE COLORADO EDUCATIONAL INTEREST INDICATOR

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Effects of Multimodal Approaches to Providing Academic Counseling Feedback on Counseling Outcomes Using the Colorado Educational Interest Indicator

by

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CHAPTER ONE

Introduction

On the first page of the prologue to his book Vocational Counseling, Williamson (1965) stated that "the only science which is valuable is the science of choice, which enables us to make the right decision." This statement embodies much of what traditional academic counseling/advising has come to represent. With its emphasis on helping college students select the one right major or set of classes academic advising has historically been neglected by researchers. This situation has begun to change in the last few years. There is an ongoing surge in interest related to the area of academic advising. Several researchers have attributed this increased interest to changes in the higher education environment. Abel (1980) saw the increased complexity of universities, the fear of declining enrollment and the heterogeneity of the student population as major factors in this increased interest. Crockett (1978) saw increased concern with student retention as a major factor in the increased interest in academic counseling. In fact, Crockett viewed academic advising as the cornerstone of student retention.

The importance of academic advising has also been recognized by the federal government. The General Accounting Office (1976) published a report of service academy attrition in which they emphasized the need for early identification of students who might possibly attrite and the need for counseling as a means of helping them clarify their goals in the hopes that this will increase retention. Trombley and Holmes (1981) cited studies by Noel (1976), Pantages and Creedon (1978), Pascarella and

Terenzini (1980) as indicating that "the academic advising system plays a major role in the students' process of identification and perception of fit with the institution" (p. 5).

All of these studies support the premise of the renewed awareness of the importance of academic counseling and advising. What is still unclear is the utility of various modes of providing feedback to students in academic counseling situations and the impact that student attribute and treatment interactions have on the utility of these feedback modes. Yet, few studies have specifically addressed these issues in reference to academic counseling. This lack of outcome research is attested to by the results of a survey conducted by Polson and Cashin (1981). They surveyed 350 members of the National Academic Advising Association. One question in particular supports the arguments for outcome research in this field. This question asked respondents to indicate one or more questions which they believed needed to be researched. The majority of responses were concerned with what is effective in academic advising or what works. This response pattern underscores the paucity of research in the field and the need for current outcome research.

Perhaps an explanation for this limited research can be found in the results of a survey conducted by Carstensen and Silberhorn (1979). This survey included data collected from 820 post secondary institutions. Based on this survey, six conclusions were reached and are summarized as follows: (1) generally colleges used faculty members to provide academic counseling, (2) academic advising has, in the past, and is currently seen as a "low-status function," (3) faculty members see academic advising as

a service that meets the informational needs of students. It has not been seen as an integral part of the students' overall development, (4) there are few effective systems in place for the evaluation of academic advising and little reward or recognition is attached to its successful delivery, (5) institutions appear to lack an overall policy regarding how academic advising will be delivered, (6) all of the post secondary education schools are communicating an increased interest in academic advising. The authors concluded by stating that this increased interest "has not yet been translated into practice" (p. 13). Research on the effectiveness of various modes of feedback in academic counseling is needed and could serve as a beginning in translating the increased interest in academic advising into practice. In addition, the paucity of research which has included attribute treatment interactions was noted by Fretz (1981). He stressed the need for research which would "maximize the possibilities for developing effective career interventions for the greatest number of participants" (p. 77). He believed that by including an analysis of possible subject attribute and treatment interactions, the probability of achieving the aforementioned goal could be enhanced.

This research is part of an on-going research program which consisted of two parts. The first part was a preliminary study which was designed to address the issues of effectiveness of multimodal approaches to providing interest inventory feedback in academic counseling situations. This preliminary study laid the ground work for the actual dissertation. It provided the pre-data for the six month follow-up. The present study which made up the actual dissertation addressed the issue

of possible client attribute and treatment interactions and provided a six month follow-up to the treatments that were accomplished in the preliminary study.

Both parts of this study were motivated in part by the work of Hoffman, Spokane and Magoon (1981) and attempted to replicate and expand their design. The Hoffman et al. (1981) study was concerned with the effect of providing feedback in a career counseling situation. The current study was concerned with the effects of providing feedback in an academic counseling situation. The present study was also conducted in the field and included a non-treatment control group. These are elaborations on the Hoffman et al. (1981) study. Gelso (1979) concluded that the field study is possibly the most powerful of the four basic research strategies he discusses. He further states "it maximally combines rigor (internal validity) and relevance (generalizability). It permits strong causual inferences and is conducted in the natural habitat of the processor it seeks to study" (p. 16). One additional factor of interest was the population of the study. This study took place at the U.S. Air Force Academy.

Due to the environmental pressure of the Academy towards the selection of a technical academic major, the highly selective entrance requirements and the forced choice of academic major by spring break (March) of the sophomore year, this could be considered an atypical collegiate environment. Baker (1980) found that 74% of Air Force Academy cadets who graduate, do so without ever changing their major. Chickering (1969) describes the "rocket curriculum as one in which your choice of

routes is limited" (p. 197). This is an apt description of the environment in which this study took place. It is obvious that the restrictions within this system necessitates the development and use of programs with the upmost utility. In this type of environment, the primary question was well stated by Parsons (1967, 1909, p. 13) when he said "the fundamental question that outranks all others is the question of adaptation, the question of uniting, so far as possible the abilities and enthusiams of the developed man with the daily work he has to do." No research has been located which specifically addresses this population or these types of restrictions. The question of the utility of various feedback modes in academic counseling for service academy students is currently unanswered.

Statement of Problem

The purpose of the preliminary study was to examine the impact of three academic counseling feedback modes (individual, audiotape and profile only) on: (a) information seeking behavior, (b) certainty of academic major choice, (c) problems of academic identity and (d) environment or personal barriers. Additionally, the study raised the question of whether any of these feedback modes impacted the congruency of the academic major chosen. Congruency was defined as being the agreement between what the Colorado Educational Interest Indicator (CEII) predicted as an excellent choice and the major the subject actually selected.

It is important to note that the data for the preliminary study was gathered as part of an on-going research program. This research was begun and the data was collected prior to an official dissertation

proposal being made. The data for this preliminary study was not analyzed prior to collecting the data for the dissertation, therefore no biasing of the present study occurred. The present study, the attbribute-treatment interaction and six month follow-up, represents the official dissertation. The study necessitated the collection of on-going and additional data on subjects who participated in the preliminary study. The additional data collected provided a means of determining the Holland type of the subjects. The Holland type was used as a means of blocking subjects into categories (people oriented or task oriented). These categories which represented the personality type of the subjects' responses to treatments to be compared not only by class membership but also by personal attribute. The present study had two main purposes. The first was to examine the possible attribute-treatment interactions of subjects. This was accomplished by examining the relationship between personal attributes of subjects (Holland type) and their responses to being provided academic counseling feedback using three different modes. This response was measured in terms of information seeking behavior, certainty of academic major choice, problems of academic identity and problems based on perception of environmental or personal barriers. Fretz (1981) has stressed the need of studies of attitude treatment interaction (ATI). He states "little progress can be made in improving the effectiveness of career interventions until more specific and systematic evaluative attention is given to the relationship of participant attributes to the effects of treatment" (p. 77). In addition, Fretz makes the point that at present, no attribute treatment interaction

studies have been published which use of one of the most logical sources of data on attitude treatment interactions - the Career Decision Scale.

The second purpose of the disseration was to provide a six month follow-up on subjects who participated in the preliminary study. This follow-up consisted of administering the majority of the instruments that were used in the preliminary study six months after treatment.

This follow-up was important for several reasons. First, it provided a opportunity to examine the effects of treatments over an extended period of time. This was particularly important in the present study due to the attribute-treatment interaction considerations. By extending the period of observation it was possible to enhance the probability of discovering any existing ATI effect. Additionally, the follow-up part of this study provided a means of establishing test-retest reliability over a six month period. This was especially important in this study because the measures used in the earlier study reported only limited reliability data. In addition, none of the reliability data had been collected in an environment which was similar to the setting of the preliminary or current study. Secondly, this six month follow-up covered a period in which over half of the subjects in the preliminary study selected an academic major.

CHAPTER TWO

Review of the Literature

Rationale for the Literature Review

The preliminary study sought to investigate the impact of providing academic interest feedback, using differential modes, on the selection of an academic major. In addition, this study investigated the impact of this feedback on information seeking behavior, certainty of choice and congruency between majors suggested by the Colorado Educational Interest Indicator and the actual major selected. Research in the area of vocational outcomes is voluminous. Research conducted by Spokane and Oliver (1982) noted that these studies have increased from only two during the period 1948-1950 to over 130 during the period 1978-1980. An extensive review of the related literature failed to find any studies that were directly related to the impact of multimodal academic feedback on the selection of an academic major. Research in the area of academic counseling, as it relates to the selection of an academic major, has been concentrated in two areas. These areas are related to the prediction of an academic major and to the impact of various techniques for increasing certainty of choice and information seeking behavior. The first part of this literature review reports on research in these areas and is related to the preliminary study.

The second part of this literature review reports on studies relevant to the dissertation research which relate to subject attribute-treatment interactions as they related to career counseling interventions. At the present no studies exist which addressed the effect that

subject attributes have on treatments in academic counseling situations. Due to the current lack of research in this area it was decided that the literature on career interventions as related to ATI studies would be the most valuable and should be included in this review.

Prediction of Academic Major

The majority of research which has been conducted to predict college major has utilized some form of multiple discriminant analysis. It is important to note that even though the present study does not use this method it was the method most often used in the literature reviewed below. This technique serves as a means of maximizing differences between groups while minimizing the differences within groups. The first study which used this technique in guidance was reported by Selover (1942). Selover used it to study the sophomore test score patterns of students concentrating in various academic areas.

Baggaley (1947) used the Kuder Preference Record and the choice of academic major of 186 freshmen to investigate differences between students who majored in the natural sciences versus those who majored in the humanities and social sciences. He found that the Kuder Preference Record could be used to provide information to the undecided student about an academic major. However, Baggaley made no statement about how information collected from the Kuder Preference Record could best be provided to these undecided students.

Bryan (1950) in his doctoral dissertation discussed a way of expanding the use of discriminant analysis to multiple groups. It was this discovery that would open the door to many of the studies that

followed. In addition, Bryan, using the Kuder Preference Record, was able to accurately discriminate among five academic areas of concentration of students enrolled at Harvard University.

In another attempt to predict college major, King (1955) studied the utility of a battery of tests consisting of 36 interest, aptitude and biographical variables. Using principal components analysis, he was able to reduce the original battery to a ten variable problem. King later computed the discriminant function of these variables across 20 academic concentration areas. It was concluded that this battery could predict area of concentration.

Research conducted by Dunn (1959) compared the efficacy of multiple discriminant analysis and multiple regression in predicting the selection of college major. In comparing the two methods, she found that certain variables were more heavily weighted in discriminant analysis while other variables were more important in the multiple regression approach. She compared these two techniques in their ability to predict college major. Her findings indicated that discriminant analysis was a more effective means of predicting college major. One limitation of her study was pointed out by Dressel (1959) in his comment published with the Dunn article. He noted tht the greater effectiveness of the discriminant analysis was due to the fact that the prediction or classification task was inappropriate for the multiple regression technique.

Cooley (1963) reported on a five year longitudinal study of career development in science. Subjects in this study were given extensive batteries of tests and were followed up five years later. Using

discriminant analysis, it was possible to determine which combination of predictors best distinguished membership in college science, college non-science, non-college technical and non-college non-technical groups.

In another longitudinal study, Campbell (1966) investigated the relationship between interest and aptitude measures and the selection of a college major. Interest and aptitude measures were obtained from entering freshmen using the Scholastic Aptitude Test (SAT) and the Milwaukee Academic Interest Inventory (MAII). Three years later the data was analyzed along with the actual college major selected. The results indicated that students in various academic majors differed in their aptitudes and interests as measured by the SAT and MAII. In addition, it was found that interest was more important than aptitude in determining membership in an academic major.

Stahmann and Wallen (1966) studied the prediction of college major using information derived from freshmen entrance examinations. This information consisted of interest and aptitude measures and an index of rural and urban high school attendance. The subjects of this study consisted of 100 graduates of the University of Utah. The study used two samples of 50 students each. Subjects were randomly assigned to an experimental sample, on which the discriminant analysis was computed and a cross validation sample on which the prediction of academic major was made. The results of this study indicated that the accurate prediction of college major could be made for students in the areas of engineering and the letters and sciences. However, the prediction of the college major in the business area could only be made at the chance level. The

authors concluded that freshmen entrance examination data could be used to predict college major but cautioned others to be aware of the problems that could arise in attempting to predict membership of more heterogenous groups such as business students.

Two more recent studies by Stahmann also addressed the question of the prediction of college major. Stahmann (1969a) investigated the validity of the Occupational Interest Inventory field of interest scores in predicting college major. This study used data collected from freshmen during orientation. The actual sample consisted of only those subjects who actually graduated. Again using discriminant analysis it was concluded that the Occupational Interest Inventory field of interest scores do have predictive validity. It was noted that the percentage of hits using the fields of interest scores only were "essentially the same as the percentages of hits obtained using the fields of interest, types of interests and level of interests scores" (p. 113). In another study by Stahmann (1969b) an attempt was made to compare the predictive validity of three types of freshmen entrance data on the selection of a college major. This data consisted of Academic Achievement test scores, Occupational Interest Inventory scores and self expression of major field. The findings of this study suggest that valuable predictive information exists in all of the data systems. For women it was found that self expressed choice was the most efficient predictor of a college major. The interest inventory ranked second and achievement data third. For men all of the data systems were less effective than they were for the women. Even so, the most effective source of data was still self

expressed choice followed closely by interest scores and the academic achievement data. This study concluded that predictions of college major made by freshmen were as efficient and in some cases more efficient than predictions based on interest inventories or academic achievement.

In a departure from the use of multiple discriminant analysis, Marks (1972) investigated the impact of gender and the degree to which the selection of college major was "saturated with natural science and mathematics requirements." The subjects consisted of 1098 feshmen (735 male and 363 female) who completed a Vocational-Educational Questionnaire. This questionnaire consisted of 14 cognitive and 14 goal variables which were related to the choice of an educational program. Subjects' responses to this questionnaire were analyzed using multivariate analysis of variance. The results of this study suggest that students who enter a field which is saturated with natural science and mathematics requirements are oriented more toward "the concrete and visible outcomes of an education" (p. 9). The students who majored in fields with less of a science and mathematics orientation valued the interpersonal rewards and usefulness to society results of their education. Students entering the more scientific areas were more certain of successfully completing their education. No difference was found with regard to certainty of the choice of college major.

In a study conducted by Lunneborg and Lunneborg (1975), discriminant analysis was once again used to predict the college major of 552 graduates from the University of Michigan. This study investigated the predictive validity of the Washington Pre-College Aptitude and

Achievement variables (WPC), the Vocational Interest Inventory (VII) and a combination of the two. The results suggested that the combination of the WPC and VII were the best predictor of college major in 11 areas. The authors discussed possible methods of providing this information to students but provided no research to support the utility of the various modes.

Whetstone and Taylor (1975b) investigated the utility of the Colorado Educational Interest Indicator (CEII) in predicting college major. In this study the entire freshman class was administered the CEII during orientation. Four years later this data was analyzed along with data that indicated which major the students had selected. The results of this study indicated that 80% of the graduates had majored in an area that the CEII had predicted as an excellent choice or a like on that student's profile.

In an unpublished doctoral dissertation, Stone (1976) investigated the relationship of the Strong Campbell Interest Inventory (SCII) and Meyers-Briggs Type Indicator (MBTI) to grade point average (GPA), length of persistence and major selected. This study suggested that the MBTI and the SCII could be used as predictors of college major.

Goldman and Hewitt (1976) researched the utility of the Scholastic Aptitude Test (SAT) in predicting college major. College majors were coded on a scale ranging from science to non-science. Data was collected which included grade point average, SAT-Verbal, SAT-Math and actual major selected. It was determined that the SAT-Math test contributed almost all of the weight in the prediction of a college major. In addition, it

was concluded that the difference between males and females in the selection of a college major is largely determined by gender differences in mathematical ability.

Only two studies were found which addressed the question of predicting an academic major at a service academy. Research conducted by Sands and Abrahams (1977) attempted to assess the relationship between vocational interests and academic major of students at the United States Naval Academy. Using the Strong Vocational Interest Blank (SVIB) all midshipmen in the classes of 1971-1973 were administered this instrument during their "plebe" (orientation) summer. Using this data, four scales were developed which attempted to differentiate academic areas of specialization. The results of this study suggested that these scales could be used to differentiate students who were likely to select a specific area of specialization. Once again no comment was made as to how these four scales could be used to advise Midshipmen. In addition, no further research was suggested which could answer this question.

Research conducted at the United States Military Academy by the Office of Institutional Research (1979) attempted to develop a counseling program and techniques to assist cadets in selecting an area of concentration that was compatible with a profile of measured interests, values and academic ability. The Strong Campbell Interest Inventory (SCII) was used to assess general occupational interests. In addition, early academic performance at the academy, Rokeach Value scores and high school rank were used as a means of predicting an area of concentration. As a result of this research a new measure was developed with high

predictive validity, r = .71. The findings of this study support the use of this new counseling measure in predicting area of concentration for cadets at the U.S. Military Academy. It was unclear how this new counseling measure would be used with cadets and upon what criteria this decision was to be made.

From this review it is evident that there are a plethora of studies that have been concerned with predicting an academic major. Variables such as interest inventories, measures of aptitude and expressed choice have all been found to be useful in predicting a college major. What is still clearly in doubt is the determination of which method of providing this information to students is the most beneficial.

Vocational Counseling Outcomes

As stated earlier in this chapter, research in the area of vocational counseling outcomes has increased markedly since 1978, while research on academic counseling outcomes appears to be nonexistent. Even though the thrust of this research is not directly vocational in nature, many of the vocational outcome studies are of interest because they explore the utility of multimodal counseling approaches and because they specifically investigate the impact of these approaches on certainty of choice and information seeking behavior. These studies appear to allow connections to be made between the utility of various multimodal vocational and academic counseling techniques.

In one of the earliest studies of multimodal counseling, Hoyt (1955) investigated the utility of individual and group counseling in increasing "satisfaction with vocational choice, certainty of choice, realism of

vocational choice and appropriateness of certainty in terms of realism" (p. 26). The findings indicated that vocational counseling by individual or group methods are effective in "producing positive changes on relevant criteria" (p. 29). It was noted that when compared with each other, individual and group treatments showed no significant differences on the outcome measures. Hoyt further noted that when these methods were compared with a wait list control group, significant differences were found. It was concluded that this research provided a strong endorsement for group programs in vocational counseling. It must be noted that Hoyt did not control for differences in the treatment content or differences in the duration of the treatments. These appeared to be major flaws in this study. In addition a single self-reported instrument was used to measure treatment outcomes.

In one of the first studies that was designed specifically to study ways of increasing information seeking behavior, Krumboltz and Thoresen (1964) attempted to "determine which of several behavioral change techniques, when applied to individual or group settings would best promote independent information seeking behavior" (p. 324). This experiment utilized two behavioral counseling approaches, reinforcement counseling and model-reinforcement counseling. These techniques were used with subjects in individual and group settings. In addition, a group control and inactive control group were utilized. For each subject, two scores were derived. The first score was related to the frequency of information seeking behavior. The second score was related to the variety of information seeking behavior. One hundred and ninety-

seven subjects participated in this study. An analysis of variance was computed for the frequency and variety of information seeking behavior. It was concluded that the four treatments did differ significantly. In particular, it was discovered that the model-reinforcement treatment was the most effective. It was concluded that on the average "females engaged in both greater frequency and variety of information seeking behavior" (p. 329). In addition, it was discovered that model-reinforcement counseling was less effective for women than for men. The authors attempted to explain this difference by noting that the model used was a male and perhaps this impacted the women. The researchers concluded that the group and individual treatments were equally effective; however, male subjects receiving the model-reinforcement counseling were more "stimulated" by the group setting. Reinforcement counseling was more effective in the individual setting.

In a study which actually preceded Krumboltz and Thoresen, but was published later, Krumboltz and Schroder (1965) investigated the effectiveness of reinforcement and model-reinforcement counseling in individual settings only. It was hypothesized that model-reinforcement counseling would encourage more external information seeking than reinforcement counseling. It was further hypothesized that reinforcement counseling would encourage more external information seeking than the control group. The results of that study indicated that both treatments produced more external information seeking behavior than the control group. However, for women, the reinforcement counseling technique was significantly more effective than it was for the control group. There

was a similar but non-significant relationship for men. In addition, men in the model-reinforcement treatment demonstrated a greater variety of information seeking behavior than men in the reinforcement treatment.

In another study of behavioral counseling techniques, Borman (1972) investigated the impact of a "selected reinforcement style of individual counseling" on the variety of information seeking. Subjects were assigned to one of three groups; individual reinforcement counseling, educational-vocational guidance and inactive control. The results of this study demonstrated no significant difference in variety of information seeking. However, a significant difference was found between more motivated and less motivated subjects.

Aiken and Johnson (1973) investigated the impact of group reinforcement counseling on the frequency of information seeking of college freshmen and sophomores. In addition, they explored Holland's (1966) concept of consistency-inconsistency of behavior patterns and Crites' (1965) maturity-immaturity dimension and their possible interactions. It was concluded that the group reinforcement treatment did increase information seeking behavior. It was further concluded that those most likely to increase their informataion seeking behavior were subjects who were scored by Hollands' Vocational Preference Inventory as vocationally consistent. Finally, the authors stressed the need for more research related to outcomes of various treatments. This study was significant because it was one of the few studies that used a pre-post-follow-up design. However the follow-up period was only three weeks after treatment. In addition, the results of this study were analyzed

using an analysis of covariance procedure but no statement is made as to whether a repeated measures procedure was used to control for the lack of independence in the independent variables.

Samaan and Parker (1973), assessed the impact of persuasive advice giving and reinforcement counseling on information seeking behavior. In a refinement to other studies of the effect of reinforcement counseling, this study (controlled) for the level of self-esteem of the subjects. It was concluded that reinforcement counseling was significantly more effective than persuasive advice giving in encouraging information seeking behavior within and outside of the interview. This result was the same regardless of the level of self-esteem of the subjects.

Research conducted by Krivatsky and Magoon (1976) investigated the effects of three counseling treatments on frequency and variety of information seeking behavior, satisfaction with treatment, time spent thinking about occupations and other measures. The treatments included two self-administered counseling modes and "traditional vocational counseling." The results of this study suggested that the treatments were equally effective. However, some advantages of the self-administered procedures were outlined. These advantages included lower costs and the possibility of using paraprofessionals.

Zytowski (1977) investigated the impact of receiving interest inventory results on self-knowledge, certainty of career choice, satisfaction with career choice and information seeking behavior. In this study, only one significant F ratio was found and that ratio was related to an increase in accuracy of self-estimates. Zytowski noted

that "no effects were observed for increase in certainty of or satisfaction with choice. Nor was information seeking behavior attributable to having received interest inventory results" (p. 156). These results are drastically different from those of Krumboltz, et al. (1964) and raise serious questions about the generalizability of these findings.

In another study which looked at information seeking behavior, Talbot and Birk (1979) compared the effect of the Self Directed Search, the Vocational Card Sort and the Vocational Exploration and Insight Kit in four areas. The number and type of occupations being considered, satisfaction with career plans, frequency and variety of information seeking behaviors, and satisfaction with treatment. Subjects consisted of 103 undergraduate women. Forty-eight percent of the subjects were freshmen, 27% sophomores, 12% juniors and 13% seniors. The data were analyzed using a one-way analysis of variance. It was concluced that subjects who were exposed to the Self Directed Search and the Vocational Exploration and Insight Kit "considered significantly more occupations than subjects exposed to the Vocational Card Sort or the control group" (p. 360). No significant differences were found with regard to satisfaction with vocational choice.

Research conducted by Hoffman, Spokane and Magoon (1981) attempted to compensate for the methodological shortcomings of earlier outcome studies by designing a study which controlled for the amount of counselor contact and the content of the counseling session. In addition, multiple outcome measures were utilized. This study compared the effectiveness of

three counseling modes. The modes included individual, audiotape and profile only treatments. Outcome measures included goal attainment scaling, Holland's Future Possibilities Inventory, the Vocational Identity Scale, Occupational Information Order Form and a post hoc cost analysis. Subjects were 33 undergraduate students (12 male, 21 female). The data was analyzed using an analysis of variance, analysis of covariance and chi square. The results of this study indicated that the individual treatment was superior on three of the eight outcome measures. These findings suggested that increased counselor contact was related to client use of information provided. The Hoffman et al. (1981) study served as a very good model upon which to base the preliminary part of this research effort. It was clearly a refinement on some of the previously reported studies. There were however some limitations to this study. First, because this study was analogue in nature it was difficult to assess how generalizable the findings were to the larger population. Secondly, this study lacked a control group. Due to this lack it was impossible to determine if any difference existed between subjects who received treatments and those who did not. Finally due to the relatively short duration of the post treatment assessment it was impossible to determine treatment effects over an extended period of time.

From this literature review it is apparent that the findings related to certainty of choice and information seeking behavior are equivocal. Much of the ambiguity of these findings can be attributed to differences in methdology, particularly the degree to which information content and amount of counselor contact were controlled. In addition, the dominance

of reinforcement counseling in the study of information seeking behavior appears to minimize the importance of other counseling techniques which are probably used more often. Furthermore, the lack of studies in which long term assessment of treatment efforts was undertaken makes it difficult if not impossible to measure the stability or fluctuation of treatment efforts over time. In order to avoid similar equivocal findings and methodological shortcomings in research which is related to the impact of interest inventory feedback in academic counseling, studies are needed which offer a high degree of control of both content and amount of contact. In addition, field studies are needed which will aid the academic counselor in generalizing the results of their environment.

Attribute-Treatment Interactions

The second part of this literature review reports on studies which are related to subject attribute-treatment interactions as they relate to career counseling interventions. At the present no studies exist which address the effect that subject attributes have on treatments in academic counseling situations. Due to the current lack of research in this area it was decided that the literature on career interventions as related to attribute-treatment interaction (ATI) studies would be the most valuable and should be included in this review.

Fretz (1981) noted that when compared to the "total body of evaluative literature for career interventions, educational instruction, and psychotherapeutic interventions, only a few studies have been designed to test client attribute-treatment interactions" (p. 78). In fact Fretz was only able to locate three career evaluation studies that

were designed specifically as Attribute-Treatment Interaction studies (ATI). This author, like Fretz, was able to locate only a small number of ATI studies. This current paucity of ATI research is a motivation and a justification for additional research in this area.

Attribute-treatment interaction studies (ATI) appear to have evolved from the recognition that most research which has compared various counseling approaches (vocational and academic) have failed to consider individual client attributes and the impact that these might have on any given treatment. Kiesler (1966, 1979) stressed the fact that researchers must recognize that clients respond differentially to similar counseling approaches. It was this interest in assessing how client attributes impact the effectiveness of various vocational counseling approaches that motivated the studies listed below.

Melhus, Hershenson and Vermillion (1973) investigated the hypothesis that subjects at different levels of vocational development would respond differently to two methods of vocational counseling. These methods included individual counseling and exposure to a computerized vocational information program (CVIS). The subjects in this study consisted of 108 high school sophomores. These subjects had all been administered the Educational Development Series (EDS) of the Scholastic Testing Service. Two scores from this battery were used to select the sample. An equal number (54) of students from the top and the bottom of the score distribution were selected to participate.

Subjects were randomly assigned to the individual and CVIS treatments. In addition a non-treatment control group was utilized. The

Occupational Plans Questionnaire (OPQ) was used to assess pre- and post-treatment results. An analysis of variance (ANOVA) was used to test the authors' hypothesis that high readiness subjects would change more by being exposed to CVIS. An anova was also used to test the hypothesis that low readiness subjects would change more with individual counseling. The findings of this study supported the second hypothesis but rejected the first. These findings suggested that individual counseling is in fact more effective for low readiness subjects. However, the CVIS treatment resulted in no significant difference regardless of subject readiness.

In another study designed specifically as ATI research, Schaefer (1976) investigated the impact of selected subject variables on the effectiveness of Holland's Self Directed Search (SDS). In this study 166 high school juniors (90 women and 76 men) were administered the SDS and within eight week all subjects were interviewed by a counselor. During this interview subjects were asked to verbally express their current and second vocational choice. The next step of this research involved the coding of these vocational choices according to Holland Typology. Next the relationship between expressed Holland type and SDS summary code were translated into a numerical congruence score. In addition to this congruence score individual subject scores were derived on three other measures. These measures included (1) Homogeneity of SDS Codes, (2) Mental Ability, and (3) Achievement Level.

The hypotheses of the author stated that there would be no significant difference on congruence scores for subjects classified at

three levels of consistency, classified as homogeneous or non-homogeneous, or classified at various mental ability and achievement levels. In addition, it was hypothesized that no interaction would exist between sex and any of the previously stated variables.

The results of this study indicated that none of the null hypotheses could be rejected. Schaefer concluded that the independent variables used in this study "did not appear to have significantly affected the expression of congruent vocational choices by junior class students who participated in this study" (p. 118). In addition, she concluded "it appears that in the present study the effectiveness of Holland's SDS was not contingent upon such variables as consistency, homogeneity, ability, achievement, or the interaction effect of sex with any of these variables" (p. 121). Based on these findings it would appear that individual differences of subjects in this study had little effect on the utility of the SDS. One apparent limitation of Schaefer's study was that she did not control for the effect of maturation on her subjects. In this study there was as much as an eight week difference in receiving the initial counseling interview. It would seem feasible to run an analysis of covariance with time of initial interview as a covariable in order to control for the possible effect of differences in the time of counselor interview.

Research conducted by Power, Holland, Daiger and Takai (1979) investigated the impact of matching students and treatments in an attempt to enhance the effectiveness of the treatments. In this study, a sample of 525 (322 females and 203 males) parochial high school students were

utilized. All subjects completed a pretest survey that asked them to list the occupations they were currently considering, to rank one of these as a first choice occupation, and to indicate their degree of satisfaction with this choice. In addition, this survey included the Identify Scale (Holland, Gottfredson & Nafziger, 1975) which is designed to measure the stability and clarity of a person's perception of self. This questionnaire also included the Vocational Decision-Making Scale (VCDM) (Holland & Holland, 1977). This scale measure decision making difficulty. At the completion of this survey all subjects were administered the Self Directed Search (SDS) (Holland, 1977).

Three weeks after the administration of the SDS subjects completed a post-test survey. The results of this survey were analyed using specific subject attributes as dependent variables. These attributes included: gender, expectation for the treatment, three levels of vocational identity, three levels of vocational decision making difficulties.

The results of this survey indicated that there was no significant difference by gender in the number or variety of occupations being considered. Males with low vocational identity considered significantly more options than subjects with medium or high vocational identity scores. Conversely, women with low vocational identify considered fewer options than women with medium or high identify scores. One particularly interesting finding was the strong negative correlation between vocational identity and VDMD scores. The authors speculate that "students with low identity and who have difficulties in vocational decision making are those for whom a self help vocational interest

inventory is insufficient by itself, that these are the individuals who most need the additional help of a vocational counselor" (p. 104).

In summary, Power et al. concluded that the "results imply that a subject's sense of identity and number of decision making difficulties may be helpful in selecting the most effective treatment for a specific subject (p. 106). These results are further justification for additional ATI research.

Research conducted by Kivlighan, Hageseth, Tipton and McGovern (1981) investigated the effects of congruency between client personality types and treatment environment on structured group vocational counseling" (p. 315). Subjects consisted of 40 (26 females and 14 males) undergraduates who had requested vocational conseling during a six week period. All subjects were administered the Vocational Preference Inventory (VPI) (1965). These VPI's were scored and subjects with primary Holland Typologies of realistic or investigative were assigned to a pool of subjects designated as Task Oriented. The pool consisted of 11 women and nine men. Subjects with a primary Holland Typology of social or enterprising were assigned to a pool of subjects designated as People Oriented. This pool consisted of 15 women and 5 men. From these two pools subjects were randomly assigned in equal numbers to a Learning Through Interaction (LTI) group or a Learning Through Individual Problem Solving (LTIPS) group. The content of the groups was identical. Only the way in which the data was explored differed. Two LTI workshops and three LTIPS workshops were conducted. Just before the workshops were to be conducted each subject completed the Attitude Scale of the Career

Maturity Inventory (CMI) (Crites, 1973). At the completion of the second workshop session this scale was readministered. In addition, subjects were asked to complete a Group Evaluation Form (GEF). Even though none of the main effects were found to be significant, a significant type by group interaction was discovered. This would indicate that matching personality type and group treatment results in greater career maturity. In addition, significant attribute treatment interactions were found for favorable perceptions of the group and information seeking behavior. The authors concluded that "congruence between client personality type and type of treatment environment enhances the effectiveness of structured group vocational counseling" (p. 319). It was further discovered that groups which stressed interaction were more effective for subjects classified as people oriented. Groups that stressed individual exploration were more effective for subjects classified as task oriented. Additionally it was found that when congruence existed between subject's personality type and type of treatment subjects demonstrated "greater career maturity, a greater number and variety of information seeking behaviors and a more positive evaluation of the structured group experience" (p. 319).

These findings are strong support for the legitimacy of ATI studies and further support Fretz's call for consideration of possible attribute treatment interactions and additional ATI research. It must be noted that the blocking technique which was utilized by Kivilghan et al. (1981) served as a model for the current study.

Purpose of the Present Study

Spokane and Oliver (1982), in their review of vocational counseling outcomes, suggest several steps which should be included in any well designed outcome study. These steps include treatment standardization, multiple measures, and uses of unobtrusive measure. These are just a few of the steps they suggested. The present study which includes the attribute-treatment interaction and the six month follow-up attempted to incorporate many of Spokane and Olivers (1982) suggestions. One purpose of the present study was to investigate the potential attribute-treatment interaction and the impact of the specific attribute (Holland type) on measures of (a) information seeking behavior, (b) certainty of choice of major, (c) problems of academic identity, and (d) environmental or personal barriers. Another purpose of the present study was to investigate the impact of three academic counseling/advising modes (treatments) following a six month period on measures of (a) information seeking behavior, (b) certainty of choice of major, (c) problems of academic identity, (d) environmental or personal barriers, and (e) the predictive validity of the Colorado Educational Interest Indicator. It should be remembered that the purpose of the preliminary study was to examine the impact of three academic counseling modes on: (a) information seeking behavior, (b) certainty of choice of major, (c) problems of academic identity, and (d) environmental or personal barriers three weeks after treatment.

Due to the equivocal results of earlier research, the present study hypothesized that no significant differences would be found among

subjects in any of the areas of interest regardless of treatment mode, class or personality type. In order to investigate these hypotheses, a significance level of .05 was selected.

Hypotheses listed below pertain only to the present study. Stated in null form, the following hypotheses were tested:

1. There will be no significant difference by treatment mode, class or personality type on measures of information seeking behavior as measured six months after treatment on the My Academic Behavior Checklist.

2. There will be no significant difference by treatment mode, class or personality type on measures of certainty of choice of major as measured six months after treatment on the Career Decision Scale.

3. There will be no significant difference by treatment mode, class or personality type on measures of academic identity as measured six months after treatment on the My Academic Situation Checklist.

4. There will be no significant difference by treatment mode, class or personality type on measurs of the need for academic information as measured six months after treatment on the My Academic Situation Checklist.

5. There will be no significant difference by treatment mode, class or personality type on measures of environmental or personal barriers as measured six months after treatment on the My Academic Situation Checklist.

6. There will be no significant difference by treatment mode, class or personality type in the predictive validity of the CEII as measured by

the agreement between the majors denoted as an excellent choice on the CEII profile and the actual major selected.

Hypotheses 1 through 5 were designed to investigate pre-test post-test differences six months after treatment. In order to accomplish this it was necessary to use a statistical procedure that allowed this researcher to hold the pre-test data constant across groups. It was determined that an analysis of covariance would meet this need.

CHAPTER THREE

Methodology

Rationale

It was stated in the introductory chapter of this study that this research effort would include data that was derived from preliminary research and a current data gathering effort. The preliminary portion of this study is very important to the overall research effort. As such, the methodology for this portion of the study will be included in this chapter along with the current Attribute Treatment Interaction (ATI) study.

Subjects

Subjects in the present study were 104 sophomore and 106 junior males who attended the U.S. Air Force Academy. Subjects' ages ranged from 17-22. The subjects had all participated in a preliminary study which attempted to assess the impact of multimodal approaches to providing academic counseling feedback. These subjects were originally selected from a population of all freshmen and sophomores at the Academy who had not declared a major. Subjects were selected based on their squadron membership. Squadrons were randomly selected and the freshmen and sophomores who were assigned to that squadron were asked to participate in this study. The total freshmen population was approximately 1500 students. The total sophomore population was approximately 1200 students. Due to the six month time lapse between the original treatment and the present study, these subjects were sophomores and juniors at the

time of the follow-up. In addition, all of the juniors had selected an academic major as required by the Academy.

Since women were not admitted to the Academy until 1976 and currently comprise only 10% of the total academy population it was impossible to develop female cadet norms for the Colorado Educational Interest Inventory (CEII). Consequently, it was decided that women should be excluded from this study.

Subjects initially indicated their willingness to participate in the preliminary research by completing the pre-treatment measures. A similar procedure was utilized in the presesnt study. Subjects were sent the follow-up materials and reminded that they had been participating in a research study. Subjects were informed that in order for the research study to be completed successfully it would be necessary to gather some additional data. Subjects were asked to complete the questionnaires that were sent to them and to return them within five days. Completing the questionnaires indicated the subjects' willingness to participate in the present study. Only volunteers were utilized. Due to the rank structure that exists at the Academy it is possible that the participants in this study perceived some subtle pressure to volunteer. This pressure could have been a factor in the high return rate at posttest and six month follow-up. All of the subjects who participated in the preliminary study and who were still enrolled at the Academy returned the follow-up questionnaires. This consisted of 210 subjects (106 freshman, 104 sophomores).

Assignment of Subjects to Treatments

Since the present study involved an analysis and expansion of data that had, in part, been collected but not analyzed, it is imperative that the subject assignment techniques of the earlier study be understood. These techniques are explained below.

Subjects were assigned to treatment based on their squadron membership. This method was selected because of the researcher's desire to maintain as much realism as possible and in order to minimize interaction between subjects receiving different treatments. Each treatment involved several squadrons; however, all treatments within a squadron were the same. It is recognized that this is not the same as random assignment of subjects. However, because of the techniques used to assign cadets to squadrons, it was believed that this lack of randomization could in some ways be compensated for.

Cadets are initially assigned by the Academy to squadrons so that the highest possible degree of equality between squadrons is obtained. In order to accomplish this, a computer program is used which assigns cadets to squadrons based on several factors. These factors include the following:

1. Academic Composite Score: This is a weighted average of SAT or ACT verbal and math scores, high school GPA, and high school class rank.

2. Physical Aptitude Examination (PAE): This is a physical fitness exam in which a score average for the entire class is computed.

3. The total number of cadets that can be assigned to each squadron.

4. The number of ethnic and minority group members in each squadron. Minority students constitute 10 percent of the entire cadet population. However the actual number of minority cadets in each squadron ranges from about six to 10 percent depending on attrition rate. This assignment process guarantees a homogeneous balanced distribution of cadets. Due to this balancing, it is possible to take intact groups and still achieve a representative sampling of the population. It must be noted that there was still a possibility that this matching process did not match cadets on all of the important variables. Matching is not a foolproof way of compensating for lack of random assignment. In an effort to achieve as much randomization as possible, subjects were randomly assigned to treatments by group (squadrons).

Subjects were initially assigned to one of three treatment conditions. These treatments were designed based on the format which was developed by Hoffman et al. (1981). In addition, a non-treatment control group was utilized. The mode of academic counseling varied with regard to format but the amount of information and length of the treatment were held constant. The three treatments are described below.

Individual Treatment.

Thirty freshmen and 30 sophomores were assigned to this treatment. Subjects in this treatment received a 30-minute scripted individual counseling session from a male or female counselor. Subjects were given a sample Colorado Educational Interest Indicator (CEII) and were asked to read it as the counselor explained the various scales and their meanings. At the completion of this review, subjects were given their actual CEII

profile. For the remainder of the 30-minute session, the subjects were instructed to review their results and to ask questions. However, no individual interpretations were given. (See appendix A for a copy of the script.)

Audio Tape Treatment.

This treatment was administered to 60 subjects (30 freshmen, 30 sophomores). These subjects were combined and assigned to two groups of 30 cadets each. Subjects met in lecternars of equal size and at the same time of day. Each subject was given a sample CEII profile and was instructed by a counselor that they should listen to the audio tape as they followed along with their sample CEII. This audio tape contained exactly the same information as the script that was used in the individual treatment. Research conducted by Krumboltz et al. (1964) found that when models are used in a counseling situation, the gender of the counselor may impact the effectiveness of the intervention. In order to control for this possibility, a male voice was used on one tape and a female voice was used on the other tape. In addition, in the room where the male voice tape was used a female proctor passed out the profiles. In the room where the female voice tape was used a male passed out the profiles. Equal number of subjects listened to each tape. At the completion of the initial review of the sample CEII, subjects were given their actual CEII profile and were instructed to review them and to ask questions. Once again no individual interpretations were given. In addition, this treatment, like the individual treatment, was limited to 30 minutes.

Profile Only Treatment.

This treatment was also administered to two groups of cadets with each group consisting of 30 subjects. This treatment, like the previous two was limited to 30 minutes. Subjects met in lecternars of equal size and at the same time of day. Subjects in this treatment were given their actual CEII profile without having seen the sample CEII. A male proctor passed out the profiles in one group while a female passed out the profiles in the other. Participants were instructed to study their profile for 30 minutes. When this was completed, they were free to leave.

All of the subjects, regardless of treatment mode, were given an Academic Information Order Form at the completion of their session. All subjects were told that if they wanted additional information about any academic major, they should forward this form to the Cadet Counseling Center and the requested information would be sent to them.

Control Group.

This group consisted of 30 freshmen and 30 sophomores who completed the pre- and post-measures but received no treatment. Subjects in this treatment were told that research was being conducted to study ways of improving academic advising at the Academy. In addition, they were told that their responses would be used to discover standard cadet patterns of behavior. Since CEII results prior to the researach had never been utilized as an aid to selecting an academic major it was believed that it would not be unethical to withhold this information.

Due to the forced choice of academic major by spring break of the sophomore year, it was decided that giving CEII results to the subjects after this time would be of limited value. It was decided that the non-treatment control group would receive no feedback.

Training of Counselors

The counselors in this research consisted of three women and five men. All counselors had a masters degree in a behavioral science area. Counselors ranged in age from 30-33. Training of the counselors took place over an eight hour period. Each counselor received a minimum of two hours of training and each counselor worked independently with the trainer. In addition, special emphasis was given to instruction in how to handle the questions of subjects in order to avoid giving individualized interpretations. Two counselors (one male, one female) were selected at random to make the audio tape which would be used in the audio tape treatment. All counselors were allowed to continue training until they and the trainer were satisfied with the quality and uniformity of their presentation.

Instrumentation

Due to the complexity of combining the preliminary study with the current research effort it was essential that the instruments used in both parts of this research effort be fully understood. In order to do this, the instruments that were used in the preliminary study will be described first. This presentation order makes sense because with the exception of the CEII, all of the instruments that were used in the preliminary study were also used in the present study. This discussion

is followed by a description of the instruments that were used only in the present study.

Colorado Educational Interest Indicator

The Colorado Educational Interest Indicator (CEII) is described by Whetsone (1980) as follows:

The Colorado Educational Interest Indicator (CEII) was designed to identify for the individual student those academic majors in which successful students with similar interests have earned degrees. The high scale scores obtained on the CEII do not prescribe which academic major a student should choose, but instead provide several promising academic majors that would be interesting to the student and worthy of serious consideration. It is not an ability or achievement test, but an educational interest inventory that indicates the specific academic majors and general educational areas chosen by students with interests most similar to students' unique interest patterns.

The format of the CEII was described by Short (1980) in the following way: The CEII uses one booklet for both sexes and is divided logically, not factor analytically, into six sections. The first section contains 185 items which are related to academic courses offered in a multitude of educational settings. The second section entitled Educational Experiences, contains 47 items which ask for information regarding a variety of course and campus activities. Section three entitled Preferred Instructor Characteristics, contains 48 items and is based on common instruction characteristics. The fourth section, Personal Preferences contains 40 items: ten in each of the four sections

related to life goals, life values, life virtues and life styles. The fifth section contains 40 items which are related to common campus Educational Opportunities and Experiences. Section six contains 39 items regarding Educational Self Concept. In addition, there are several check scales which guard against marking errors and obvious faking.

Norming Procedures: Anastasi (1982, p. 86) stresses the importance of the normative sample accurately representing the population under consideration. Because of the highly selective admissions procedures and the limited number of academic majors offered at the Academy, it was decided that only local norms for the CEII could provide useful information to the cadets. Anastasi (1982, p. 89) points out that local norms are often more appropriate than national norms. Due to the unique nature of the population under consideration and the advantage of locally derived norms, it was decided that Air Force Academy specific norms would have the most utility for these subjects and this research.

Before any student was assigned to a norm group, they were screened using criteria that were very similar to those used by Whetsone and Taylor (1975b) in the original norming of the CEII. There were five criteria used in screening potential norm group members. These included:

1. The subjects must be male.
2. The subjects must have declared an academic major.
3. The subjects must have completed at least 80% of his academic program.
4. Each subject must have a minimum of a 2.3 grade point average.

5. Each subject must be in the typical age range for students a the Academy (18-25).

Based on the aforementioned criteria and rationale, a norm group o 1,000 juniors and seniors was selected in order to create Air Forc Academy specific norms for the CEII. In the pilot study of the origina CEII, Whetstone discovered that he could accurately discriminate betwee members of various academic majors based on the academic interes patterns of as few as 30 students in each group. Based on this earlie research, it was decided that the Air Force Academy norm groups woul have a mimimum of 30 students in each academic major. All of the nor group majors exceeded this minimum standard.

Reliability.

Whetstone and Taylor (1975a) stated that since the CEII is a multi dimensional instrument, the split half and K-20 measures of reliabili were considered inappropriate. These researchers considered the Alp coefficient to be a more effective and appropriate measure of reliabili for the CEII. Each cluster scale on the CEII was required to have Cronbach Alpha coefficient of at least .80. No alternate fo reliability is available because at the present, no parallel form of t CEII exists. Whetstone and Taylor (1975b) indicated tht they believ the test-retest method would be the most appropriate means of estimati the reliability of CEII. They found an average test-retest reliabili of .89 over a 30 day period. Research conducted by Bryant and Ri (1982) at the U.S. Air Force Academy found an average test-rete reliability of .83 over a one year period.

Validity.

Before any item was included in the CEII item pool, its content validity was established based on the ratings of two psychologists. A study is currently being conducted by Whetstone and Flynn which will attempt to assess the concurrent validity of the CEII by deriving correlatioins between the CEII and other instruments such as the Strong-Campbell Interest Inventory, the Educational Interest Inventory, and the Kuder Vocational Interest Inventory. For the CEII, perhaps the most important type of validity is predictive validity. Whetstone and Taylor (1975b) report that the CEII has demonstrated predictive validity for academic field of choice as high as .80 over a four year period.

Score Report.

The CEII score report that was designed specifically for use in this study, provides the user with four types of scores. The first score consists of 20 Academic Major Interest Scales. The second set of scores are comprised of 33 Educational Cluster Scales. The third set of scores consist of four Response Tally Scores. The fourth score is an Educational Level Percentile Score. The Academic Major Scales are the only CEII scales that will be analyzed in this study.

CEII Academic Major Scales.

Whetstone and Taylor (1980) describe the Academic Major Scales as being comprised of diverse items that may have no central theme. The items became a part of the scale simply because the norm group students in that major consistently liked or disliked these items substantially more than the same sex students in the students in general group.

Scores on this scale are reported in percentages, which indicate the number of students who scored below the student in question. There are five categories in which scores on this scale are placed. These categories include: Excellent Choice, Academic Major Interest Scale scores of 80-99% are placed in this category; Like, Academic Major Interest Scale scores of 70-79% are placed in this category; Indifferent, Academic Major Interest Scale scores of 60-69% are placed in this category; Dislike, Academic Major Scores of 40-59% are located here; Active Reject, Academic Major Interest Scale scores of 1-39% are placed in this category. Appendix A includes a CEII booklet, answer sheet and a sample CEII profile.

CEII Educational Cluster Scales.

These 33 Educational Cluster Scales were developed using cluster analysis. Each cluster scale consist of highly intercorrelated items whose content is similar to the scale name. These scales are homogenous as opposed to the highly heterogenous Academic Major Interest Scales. The CEII Educational Cluster Scales are used to indicate how well a student likes a group of activities which are similar to the scale name.

CEII Response Tally Scores.

This scale consists of the listing of the percent of Like responses, Indifferent responses, Dislike responses. In addition, this scale includes a ratio of the number of subject responses scored as compared to the total number of possible responses on the CEII.

CEII Educational Level Scale.

The Educational Level Scale (EDL) was designed to determine if the interest patterns of students were similar to graduate school students, undergraduate students or technical training students. The EDL score indicates the percentage of students who were less interested in pursuing a higher education than the student in question.

Career Decision Scale.

The Career Decision Scale (CDS) is described by Osipow (1980) as "an instrument designed to identify barriers preventing individuals from making career decisions" (p. 1). It was created by Osipow, Carney, Winer, Yanico and Koschier (1976). The CDS is based on the belief that a "finite" number of situations are responsible for the difficulties that people experience in reaching "appropriate closure and implementation of educational and vocational decisions" (p. 1). The CDS is easily administered by having each subject circle one of four responses which indicate the degree to which each of the 18 statements accurately describe the subject and/or his situation. Circling a four would indicate high similarity. Circling a one would indicate high dissimilarity. (Appendix B includes a copy of the CDS.)

Scoring.

Osipow (1980) described the scoring of the CDS as follows: "Items 1 and 2 indicate certainty of choice of career and school major. These scores correlate negatively with items 3 through 18" (p. 2). These are the indecision items and the indecision score is based on a total of these items.

Reliability.

Two studies were reported by Osipow (1980) as providing support for the reliability of the CDS. Osipow, Carney and Barak (1976) reported test-retest correlations of .90 in one study and .82 in a second study which took place over a two week period. In addition, Osipow cited research by Slaney and Palko-Nonemaker (1981) as finding an overall test-retest reliability of .70 over a six week period.

Validity.

There have been numerous studies which have provided support for the validity of the CDS. Carney (cited in Osipow, 1980, p. 7) stated that "tests of the pre to post changes on the Career Decision Scale revealed significant gains in the first two items - career and educational decideness, and significant reductions in the total of item 3-18, the general index of undecideness." Research conducted by Limberg (cited in Osipow, 1980, p. 12) concluded that the CDS effectively differentiated decided from undecided students.

My Academic Situation.

This instrument consisted of a modified measured, My Vocational Situation (Holland, Daiger & Power, 1980 - see Appendix C). The original instrument was developed based on the theory of the authors that "the majority of difficulties in career decisions making fall into one of three categories. These include (1) problems of vocational identity; (2) lack of information or training; (3) environmental or personal barriers" (p. 1). The authors define Vocatinal Identity as "the possession of a clear and stable picture of one's goals, interests and talents" (p. 1).

It was this theoretical stance which motivated the modification of the original instrument for use in an academic counseling mode. The new insrument, My Academic Situation was created by rewording the questions so that they addressed the issue of selection of an academic major rather than an occupation. In most cases, this required only changing the word occupation to academic major. Most other changes were made in order to make the instrument more appropriate for use at the Air Force Academy. In this modified measure, items 1-18 are measures of academic identity. This academic identity is similar to the original concept of vocational identity except that it is specifically related to the goals, interests, personality and talents which address the selection of an academic major. Question 19 has four sub-parts but overall is a measure of the need for academic information. Question 20 has three sub-parts but overall is related to external barriers that might impact or interfere with selecting the academic major the student really wants. (Appendix C includes a copy of the MAS).

Administration and Scoring

The modified instrument, like the original, is self-administered and hand scored. Scoring is very simple. The Academic Identity Score is obtained by counting the number of true responses on items 1-18. The Academic Information Score is derived by totalling the number of yes responses to the four sub-parts of item 19. The External Barriers Score is obtained by counting the number of yes responses to the three sub-parts of item 20.

Reliability.

Reliability for the modified instrument was established by sampling 50 freshmen at the Air Force Academy. These subjects were administered the modified form and one week later were retested using the same form. The test-retest reliability was .93 over this time period.

Validity.

The validity of My Academic Situation is based on research which was conducted on the original My Vocational Situation. At the present, no validity study has been conducted using the modified form. However, research conducted by Holland, Gottfredson and Power (1980) firmly established that the validity of this instrument "lies in the origin of the items, the scale development and the research which was conducted to test their hypotheses about the relationship of vocational identity to age, educational level, vocational aspiration and other criteria." This research concluded that the vocational identity scale, occupational information scale and external barriers scale had small to moderate correlations with age. In addition, the results indicated that subjects irregardless of gender, "with a clear sense of identity and with a small number of informational needs have a small number of vocational aspirations" (p. 4). It was concluded from these studies that My Vocational Situation could be used to assess subjects' needs for vocational assistance and for possibly directing subjects into specific types of treatments. It was further concluded that the Occupational Information and External Barriers Scales could best be used as check-lists which could possibly assist in identifying problem areas that might

otherwise go unnoticed. Although the general wording of the questions was changed, the format and theoretical assumptions were unchanged. It was believed that the construct validity of the instrument should not be changed by the modifications that were made in order to make the measure more applicable to the research population.

My Academic Behavior.

This instrument was designed to assess the self-reported information seeking behavior of the subjects who participated in this research program. The format of this instrument was originally used in the Hoffman et al. (1981) study. In order to enhance the utility of this instrument for the present study it was decided that the instrument would be modified so that the information seeking behaviors it reported would apply only to academic information seeking. This instrument solicited information in three areas. These included: information about the most likely choice of major, information about how satisfied a subject was with his choice of major and specifically how much information seeking the subject engaged in during the course of the semester. (See Appendix D.) This checklist was administered to all subjects who participated in the preliminary study (pre-test and post-test) and to those subjects who participated in the present study (six month follow-up). In order to complete this checklist subjects were asked to fill in the blocks that were most indicative of their current status with regard to their most likely choice of major, their satisfaction with that choice and their actual academic information seeking behavior during the current semester.

Academic Information Request Card

This card was a modified version of a form that was used by Hoffman et al. (1981). This card was used as unobtrusive measure of information seeking behavior. (See Appendix E.) This card was given to all subjects except the non-treatment control group. Subjects were instructed to write in the information they wanted and to forward the card to the Counseling Center. All requests were processed as soon as received and standardized information, extracted from the curriculum handbook was returned to the subjects.

Additional Rationale

In order to address the two main purposes of the present study (ATI and followup) the following techniques were used. In terms of the ATI, two blocking techniques were utilized. First, in order to examine the possible interaction between treatment mode and personality type, subjects were blocked into two categories based on their responses to Holland's Vocational Preference Inventory (VPI). As in research conducted by Kivlighan, Hageseth, Tipton and McGovern (1981), subjects were assigned to a category based on their Holland typology. The two categories were People Oriented, which consisted of enterprising and social types and Task Oriented which consisted of investigative and realistic types. Subjects who had Holland types of artistic or conventional were excluded from further analysis. This blocking procedure resulted in 64 subjects being categorized as people oriented, 106 subjects being categorized as task oriented and 20 subjects being excluded because they had artisitic or conventional Holland types. The

remaining 20 subjects did not complete the VPI and therefore could not be categorized.

The second major purpose of this study was to provide follow-up data after six months. Fretz (1981) stressed the possible utility of Osipow's Career Decision Scale and the lack of research related to its use. He stated "at present no client attribute - treatment interaction studies have been published using these recent diagnostic measures" (p. 78). In addition, due to the lack of ATI studies noted above, Fretz (1981) recommended that follow-up studies of from one to six months be included in future ATI research. He also suggested that where appropriate multivariate analysis of variance be used as a means of "identifying whether selected treatment parameters lead singly or in combination to a generalized impact" (p. 87). Based on these statements, it was decided that all subjects who participated in the preliminary study would be retested on the Career Decision Scale, My Academic Situation and My Academic Behavior. In addition, subjects were administered the Vocational Preference Inventory (VPI) as a part of the followup package. All of the instruments used in this study were described earlier with the exception of the VPI. A description of this instrument follows.

Vocational Preference Inventory (VPI)

The manual for the VPI describes the inventory as "a personality inventory composed entirely of 160 occupational titles" (p. 5). The instrument consists of 160 occupational titles which were designed to assess personality in terms of Holland typology and to measure vocational interest. The VPI is self-administered. The subject only has to

indicate his or her occupational preference. The total inventory can be completed in as little as 15 to 30 minutes.

Reliability.

The VPI has been shown to have moderate to high reliability, based on studies reported in the VPI manual (1978). In a study exploring test re-test reliability coefficients ranged from a high of .98 to a low of .62. In a similar study, the VPI manual reported test retest reliability for college freshmen over a one year period. The reliability coefficients ranged from a high of .93 to a low of .61.

Validity.

The validity of the VPI has been examined using several variables. These include theoretical, personality, interests, values, competencies and aptitudes. The VPI manual (1978) notes that the book Making Vocational Choices "summarizes more than 100 empirical studies about the characteristics attributed to the first six VPI scales" (p. 19). In addition, the manual reports correlations between the VPI and several personality measures (MMPI, CPI). The vast amount of validity data is provided in the manual summarized in the following way:

1. The interest scales (Real, Int, Soc, Conv, Ent and Art) appear to have moderate validity for predicting occupatinal membership and field of training.

2. The VPI scales, as personality scales provide a broad range of descriptive information but the reliability of such information is usually low. (See Appendix F.)

All of the subjects who participated in the present study were administered the instruments discussed earlier in this chapter at least three times. There were however some exceptions. The CEII and the Academic Information request card were administered only once during the preliminary study. The Vocational Planning Inventory was administered only once during the present study. The three administrations of the instruments occurred in the following sequence. The first and second administrations occurred as the pre-test and post-test for the preliminary study. This testing occurred three weeks before treatment and three weeks after. The third administration made up the present study and provided the six month follow-up and attribute-treatment interaction data.

Analyses

Due to the inability of this researcher to randomly assign individual subjects to treatments (subjects were randomly assigned to treatments based on squadron membership) it was necessary to assure that any initial differences between treatment groups were accounted for and that suitable adjustments were made. In order to accomplish this, pre-test responses of subjects which were acquired during the preliminary study, were used as a covariate to control for initial differences in treatment groups related to the lack of random assignment of subjects to treatments. Tests for homogeneity of variance and homogeneity of regression provided support for the use of the analysis of covariance in this study. In addition, since this study investigated the impact of treatment mode, class and personality type six months after treatment it

was decided that pre-test and post-test scores of the preliminary study would be used to investigate the long term effects of treatments. By using the post-test scores from the preliminary study as a covariate for the six month follow-up it was possible to identify gain scores over the six month follow up period while controlling for any initial effect of participation in this study.

It was determined that the most appropriate means of analyzing the data in this study was by using analysis of covariance (ANCOVA) and chi square analysis.

Five of the six research questions that were related to the preliminary study were investigated using a 4 x 2 x 2 analysis of covariance (ANCOVA). The sixth research question was investigated using Chi-square analysis. Findings related to these research questions are reported in a special section of the next chapter.

The following six hypotheses are all related to the present study.

Hypothesis one stated that there would be no significant difference by treatment mode, class or personality type on measures of information seeking behavior as measured six months after treatment on the My Academic Behavior Checklist. This hypothesis was investigated using two separate ANCOVAs. The first was a 4 x 2 x 2 ANCOVA which compared the variables listed above with a composite score of self-reported information seeking behavior six months after treatment. This ANCOVA used pre-test scores from the preliminary study as a covariate. The second ANCOVA was identical to the first with the exception of the covariate. This ANCOVA used post-test scores from the preliminary study (three weeks

after treatment) as the covariate. It was believed by this author that by using the two separate ANCOVAs it would be possible to investigate not only any significant differences between subjects' initial self-reported information seeking behavior and that behavior six months later but also it would be possible to explore the effects of treatment mode, class and personality type from three weeks after treatment to six months after treatment. This provided an opportunity to discover any effect of participating in this study that was additional to the immediate effect which was investigated at the three weeks after treatment point.

Hypothesis two stated that there would be no significant difference by treatment mode, class or personality type on measures of certainty of choice of academic major as measured six months after treatment on the Career Decision Scale. This hypothesis was investigated using two 4 x 2 x 2 ANCOVAs which compared the variables listed above to subjects' responses to item two of the Career Decision Scale. The differences in the two ANCOVAs was that the first used the pre-test score as a covariate while the second used the post-test score as a covariate.

Hypothesis three stated that there would be no significant difference by treatment mode, class or personality type on measures of academic identity as measured six months after treatment on the My Academic Situation Checklist. In order to investigate this hypothesis two 4 x 2 x 2 ANCOVAs were run which compared the variables listed above based on a composite score of the number of true responses to items one through 18 on the My Academic Situation Checklist. As in the previously stated hypothesis, the difference between the two ANCOVAs was that the

former used the pre-test as a covariate while the latter used the post-test as a covariate.

Hypothesis four stated that there would be no significant difference by treatment mode, class or personality type on measures of the need for academic information as measured six months after treatment on the My Academic Situation Checklist. This hypothesis was investigated using two 4 x 2 x 2 ANCOVAs. These ANCOVAs compared the variables listed above to a composite score of subjects' responses to item 19 of the My Academic Situation Checklist. Like several of the previously stated hypotheses, this hypothesis used pre-test and post-test scores from the preliminary study as covariates.

Hypothesis five stated that there would be no significant difference by treatment mode, class or personality type on measures of environmental or personal barriers as measured six months after treatment on the My Academic Situation Checklist. This hypothesis was investigated using two 4 x 2 x 2 ANCOVAs. The first used pre-test scores as a covariate. The second ANCOVA used post-test scores as a covariate. These ANCOVAs compared the variables listed above with a composite score of subjects' responses to item 20 of the My Academic Situation Checklist.

Hypothesis six stated that there would be no significant difference by treatment mode, class or personality type in the predictive validity of the CEII as measured by the agreement between majors denoted as an excellent choice on the CEII profile and the actual major selected. This hypothesis was investigated by using the MacArthur (1954) method of establishing the hit rate. A major that was predicted as an excellent

choice on the CEII profile and that was selected by that subject was labeled a good hit. A major that was predicted as a "like" on the CEII profile was labeled a low hit. The selection of any other major was labeled a miss. Based on this assignment system a chi square analysis (X^2) was run which compared treatment mode, class and personality type.

The final analysis of this study consisted of a post hoc cost analysis. It was hypothesized that there would be no significant difference in the effect of a treatment based on the cost of providing it. The methods described by Coffman, Slaikeu and Iscoe (1979) were used as a guideline for this analysis. It was decided that these methods would provide a viable means of determining the overall benefit of each treatment in terms of its cost.

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CHAPTER FOUR

Results

Of the 240 subjects who participated in the preliminary study, all subjects returned the post-test instruments which were sent to them through the campus mail three weeks after treatment. In the six months that followed the treatment, 30 subjects resigned from the Academy and were unavailable for the six month follow-up evaluation. All 210 of the remaining subjects responded to the six month follow-up evaluation. However, there were 36 subjects for whom personality type data was unavailable. Twenty of these subjects were excluded from further analysis because their Holland types did not allow them to be classified as task oriented or people oriented (18 were artistic types and two were conventional types). These exclusions were in keeping with the method that was used by Kivlighan, Hageseth, Tipton and McGovern (1981). The remaining 16 subjects were excluded from the present study because of incomplete or unanswered Vocational Preference inventories. Since the present study was concerned with potential attribute by treatment interactions and a six month follow-up evaluation, it was decided that the 36 subjects described above would be excluded from further analysis. It was further decided that an analysis of covariance (ANCOVA) would be used to analyze the data related to the preliminary study and the present study. This ANCOVA compared the dependent variable of interest by treatment mode, class (freshman or sophomore) and personality type (task oriented or people oriented).

In order to fully understand the meaning of the findings related to the present study, it is necessary to provide a summary of the findings related to the preliminary study. This summary is presented below.

Summary of Preliminary Study Findings

The preliminary study investigated the impact of providing subjects with academic interest inventory feedback using differential modes. This impact was measured in terms of self-reported information seeking behavior, certainty of choice of academic major, academic identity, need for academic information, and environmental or personal barriers. All of these areas were assessed three weeks after treatment and analyzed in terms of differences between treatment modes, classes and personality types. The findings related to each area of emphasis are reported below.

Information Seeking Behavior.

In order to analyze this area of the preliminary study, an analysis of covariance (ANCOVA) was used. In this analysis the pre-test scores on the My Academic Behavior checklist were used as a covariate. This analysis found a significant main effect for treatment. However, no other main effects or interactions reached significance. Table 1 reports the results of this ANCOVA. Table 2 lists the means, standard deviations and effect sizes for each treatment. In addition to the previously stated analyses, post hoc Scheffe tests were performed in order to compare the four treatment groups. The results of these tests indicated that there were no significant differences between the individual, audio

Table 1

Summary of an Analysis of Covariance for

Information Seeking Behavior Three Weeks After Treatment

(N = 176)

Source	SS	df	MS	F
Main effects				
Treatment	3193.28	3	1064.43	3.67*
Class	302.87	1	302.87	1.04
Type	18.79	1	18.79	.06
Interaction				
Treatment x Class	131.49	3	43.83	.15
Treatment x Type	657.05	3	219.01	.75
Class x Type	120.47	1	120.47	.42
Treatment x Class x Type	1043.77	3	347.92	1.20

$p < .05$

Table 2

Means, Standard Deviations and Effect Sizes for

Information Seeking Behavior by Treatment Mode

Three Weeks After Treatment

(N = 176)

Treatment	M*	SD	ES
Individual	46.66	17.62	.25
Audio tape	47.02	22.99	.26
Profile only	48.01	25.66	.30
Control	40.69	24.23	

*Adjusted Means

tape and profile only treatments. However, a significant difference was found between the control group and the other three treatments ($p < .05$).

Certainty of Choice of Major.

An analysis of covariance was also performed on measures of the certainty of choice of academic major. The pre-test scores on the Career Decision Scale were used as a covariate. This analysis resulted in a significant main effect for class. All other main effects and interactions were non-significant. The means and standard deviations for each class are provided in Table 3.

Academic Identity.

This area was analyzed in a manner similar to the preceding areas. An ANCOVA was performed which utilized pre-test scores on the My Academic Situation checklist as a covariate. Using this procedure, a significant main effect for class was discovered. However, no other main effects or interactions reached significance. The means and standard deviations for each class are reported in Table 4. A point of clarification must be made at this time. When reviewing Table 4, it should be noted that the lower the mean, the higher the subjects' academic identity. In this case the sophomores demonstrated significantly higher academic identity than the freshmen.

Need for Academic Information.

This area of investigation was concerned with the subject's self-reported need for information about various academic majors. The analysis of this area was conducted by performing a ANCOVA which utilized pre-test scores on the My Academic Situation checklist as a

Table 3

Means and Standard Deviations for Educational Certainty

By Class Three Weeks After Treatment

(N = 177)

Class	M*	SD
Freshmen	2.38	.92
Sophomores	3.39	.78

$F = 52.50$ $p < .001$

*Adjusted Means

Table 4

Means and Standard Deviations by Class on Measures of Academic Identity Three Weeks After Treatment

(N = 177)

Class	M*	SD
Freshmen	7.04	3.90
Sophomores	4.78	3.84

$p < .01$

*Adjusted Means

covariate. This ANCOVA which compared treatment mode, class and personality type found no significant main effects or interactions. Table 5 reports the results of this analysis.

Environmental or Personal Barriers.

This area like the preceding areas was investigated using an ANCOVA. This analysis was designed to evaluate if perceived environmental or personal barriers had an impact on subjects based on treatment mode, class, or personality type. In order to perform this analysis the pre-test scores on the My Academic Situation checlist were used as a covariate. This analysis found no significant main effects. However, a significant class by treatment interaction was found. A summary of this ANCOVA is provided in Table 6.

In order to clarify the nature of the significant class by treatment interaction, the means for each treatment and class were plotted. This data is presented in Figure 1.

Information Request Card.

The Academic Information Request Card provided an unobtrusive measure of the subjects' need for additional academic information after treatment. Since this area of investigation was concerned with the frequency with which the Information Request Care was returned, it was decided that a Chi-square analysis (X^2) would be the most appropriate statistical model. Chi-squares were performed by treatment mode, class and personality type. The results of these analyses found a nonsignificant effect for class and personality type. A significant Chi-square was found for treatment mode. The results of this analysis are reported in

Table 5

Summay of Analysis of Covariance on Measures of the Need for Academic Information Three Weeks After Treatment (N = 175)

Source	SS	df	MS	F
Main effects				
Treatment	5.91	3	1.97	1.39
Class	4.65	1	4.65	3.28
Type				
Interaction				
Class x Treatment	4.28	3	1.43	1.00
Class x Type	.91	1	.91	.64
Treatment x Type	.16	3	.05	.04
Class x Treatment x Type	2.31	3	.77	.54

Table 6

Summary of Analysis of Covariance by Treatment Mode, Class and Personality Type on Measures of Environmental or Personal Barriers Three Weeks After Treatment

(N = 175)

Source	SS	df	MS	F
Main effects				
Treatment	.537	3	.179	.809
Class	.156	1	.156	.709
Type	.0006	1	.0006	.002
Interaction				
Class x Treatment	1.98	3	.66	2.99*
Class x Type	.023	1	.023	.105
Treatment x Type	.577	3	.192	.87
Class x Treatment x Type	.521	3	.173	.785

* $p = .033$

Table 6

Summary of Analysis of Covariance by Treatment Mode, Class and Personality Type on Measures of Environmental or Personal Barriers Three Weeks After Treatment

(N = 175)

Source	SS	df	MS	F
Main effects				
Treatment	.537	3	.179	.809
Class	.156	1	.156	.709
Type	.0006	1	.0006	.002
Interaction				
Class x Treatment	1.98	3	.66	2.99*
Class x Type	.023	1	.023	.105
Treatment x Type	.577	3	.192	.87
Class x Treatment x Type	.521	3	.173	.785

*p = .033

Figure 1

Plot of the Class by Treatment Interaction for Environmental Barriers

Three Weeks After Treatment

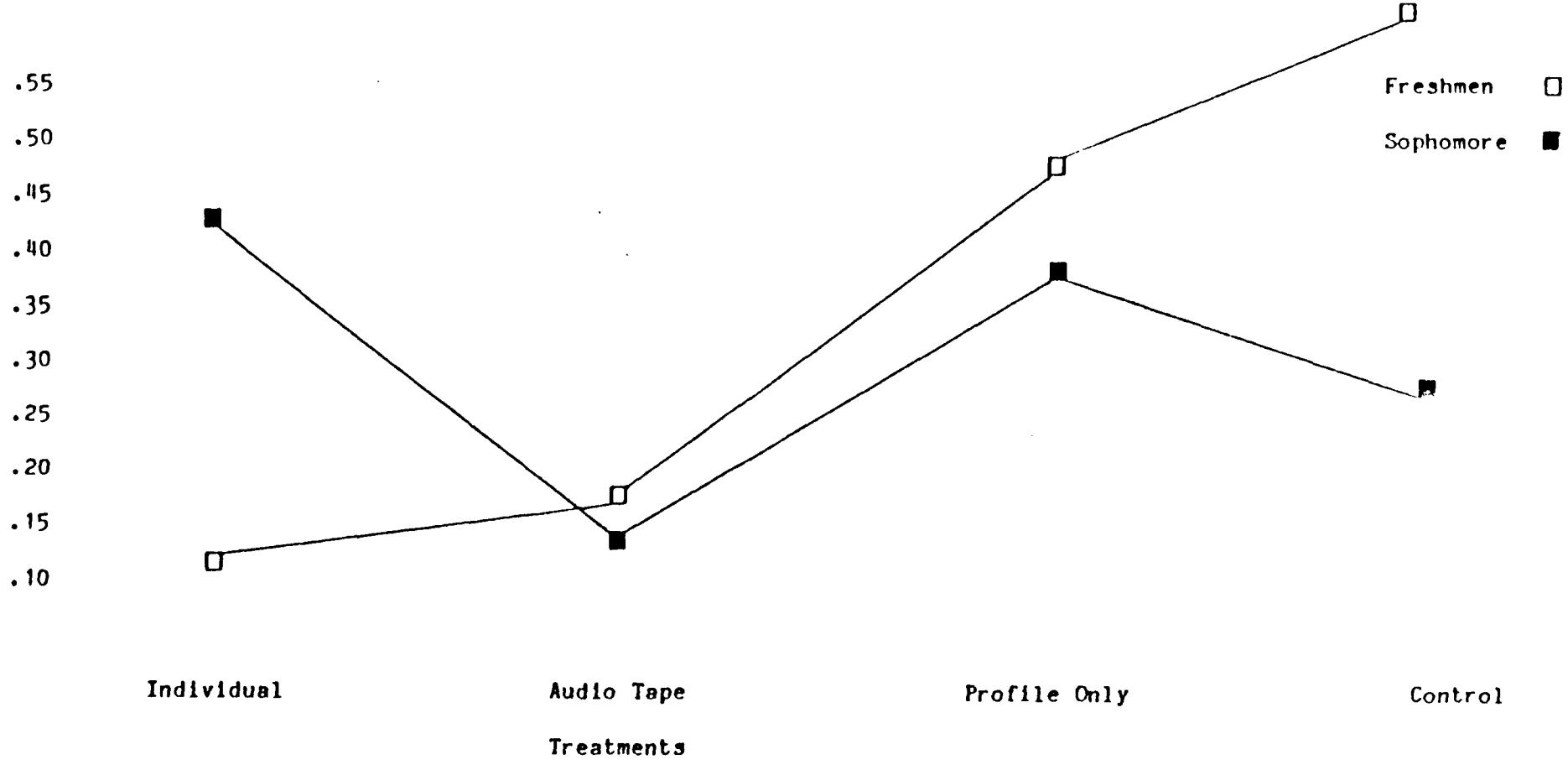


Table 7. From the data presented in Table 7 it is evident that the subjects who received the individual treatment requested significantly more information than the other active treatments.

Present Study Results

Hypothesis 1.

The first hypothesis in the present study stated that there would be no significant difference by treatment mode, class or personality type on measures of information seeking behavior as assessed six months after treatment on the My Academic Behavior Checklist (MAB). This hypothesis was tested using ANCOVA procedures. The first ANCOVA that was performed compared information seeking behavior by treatment mode, class and personality type. This analysis used pre-test scores from the preliminary study as a covariate. This analysis yielded a significant main effect for class. All other main effects and interactions were nonsignificant. The results of this analysis are provided in Table 8.

Since one of the purposes of the present study was to access the long term effects of providing academic interest inventory feedback to subjects, it was decided that a second ANCOVA was needed. This second ANCOVA was used to assess the effects of providing feedback six months after it was given. This was accomplished by using the post-test scores from the preliminary study as a covariate. This procedure allowed the researcher to investigate possible changes in scores that occurred between the three week post-test and the six month follow-up. This analysis compared treatment mode, class and personality type on measures of information seeking behavior. This analysis resulted in a significant

Table 7

Chi-Square Analysis of the Return Rate of the Information Request Card by Treatment Mode

(N = 180)

	Treatment			
	Individual	Audio Tape	Profile Only	Row Total
RETURNED				
Count	18	10	6	34
Percent	30	16.7	10	

$X^2 = 8.12$

df = 2

$p = .01$

Table 8

Summary of Analysis of Covariance on Measures of Information Seeking Behavior Six Months After Treatment with Pre-Test as Covariate

(N = 174)

Source	SS	df	MS	F
Main effects				
Treatment	1346.25	3	448.75	1.01
Class	11581.40	1	11581.40	26.10*
Type	17.77	1	17.77	.04
Interaction				
Treatment x Class	1237.92	3	412.64	.95
Treatment x Type	1520.95	3	506.98	1.14
Class x Type	48.00	1	48.00	.11
Treatment x Class x Type	1380.54	3	460.18	1.04

* $p < .01$

main effect for class. No other main effects or interactions reached significance. The results of this second ANCOVA are reported in Table 9.

Hypothesis 2.

This hypothesis stated that there would be no significant differences by treatment mode, class or personality type on measures of the certainty of choice of academic major six months after treatment on the Career Decision Scale (CDS). This hypothesis was tested by performing an ANCOVA which compared academic certainty by treatment mode, class and personality type. Pre-test scores from the preliminary study were used as a covariate. This analysis found a significant main effect for class. No other main effects or interactions reached significance. As a result of this finding, the null hypothesis was rejected. Table 10 lists the means and standard deviations for each class.

Hypothesis 3.

This hypothesis stated that there would be no significant difference by treatment mode, class or personality type on measures of academic identity as measured six months after treatment on the My Academic Situation checklist (MAS). This hypothesis was tested by performing an ANCOVA which used pre-test scores from the preliminary study as a covariate. This analysis yielded no significant main effects or interactions. Based on these findings the null hypothesis could not be rejected. The results of this analysis are reported in Table 11. In order to assess the potential changes in academic identity that occurred during the three weeks after treatment assessment and the six months

Table 9

Summary of Analysis of Covariance on

Information Seeking Behavior by Treatment Mode, Class and

Personality Type with the Post-Test as a Covariate

(N = 173)

Source	SS	df	MS	F
Main effects				
Treatment	1742.09	3	580.69	1.27
Class	9903.30	1	9903.30	21.79*
Type	78.40	1	78.40	.17
Interaction				
Treatment x Class	880.36	3	293.45	.64
Treatment x Type	2372.12	3	790.70	1.74
Class x Type	19.73	1	19.73	.04
Treatment x Class x Type	1755.30	3	585.10	.28

Table 10

Means and Standard Deviations by Class on Measures of Certainty of Choice of Academic Major Six Months After Treatment (N = 176)

Class	M*	SD
Freshmen	3.28	.80
Sophomores	3.60	.61

$F = 7.08$

$p < .005$

*Adjusted Means

Table 11

Summary of Analysis of Covariance on Measures of Academic Identity by Treatment Mode, Class and Personality Type with the Pre-Test as Covariate Six Months After Treatment (N = 175)

Source	SS	df	MS	F
Main effects				
Treatment	5.58	3	1.86	.22
Class	1.38	1	1.38	.16
Type	.00	1	.00	.00
Interaction				
Treatment x Class	37.32	3	12.44	1.47
Treatment x Type	12.38	3	4.13	.49
Class x Type	1.61	1	1.61	.19
Treatment x Class x Type	18.68	3	6.23	.74

after treatment time frame, it was decided that a second ANCOVA would be performed. This ANCOVA used post-test scores from the preliminary study as a covariate. This method allowed the researcher to control for any differences that existed between subjects three weeks after treatment. This analysis resulted in no significant main effects or interactions. The results of this analysis are reported in Table 12.

Hypothesis 4.

This hypothesis stated that there would be no significant difference by treatment mode, class or personality type on measures of the need for academic information as measured six months after treatment on the My Academic Situation checklist (MAS). This hypothesis was tested in a manner similar to the preceding hypothesis. Two ANCOVAs were performed. The first ANCOVA used pre-test scores from the preliminary study as a covariate. This method allowed the researcher to control for initial differences between subjects. The second ANCOVA was performed as a means of assessing potential gain scores that occurred three weeks and six months after treatment. The results of both analyses indicated that there were no significant main effects or interactions. Based on these findings Hypothesis 4 could not be rejected. The results of the first ANCOVA are reported in Table 13.

Hypothesis 5.

This hypothesis stated that there would be no significant difference by treatment mode, class or personality type on measures of environmental or personal barriers as measured six months after treatment on the My Academic Situation checklist. This hypothesis was also tested using

Table 12

Summary of Analysis of Covariance on Measures of Academic Identity by Treatment Mode, Class and Personality Type with the Post-Test as a Covariate

(N = 175)

Source	SS	df	MS	F
Main effects				
Treatment	14.94	3	4.98	.56
Class	2.29	1	2.29	.26
Type	7.83	1	7.83	.88
Interaction				
Treatment x Class	32.36	3	10.79	1.21
Treatment x Type	10.71	3	3.57	.40
Class x Type	.00	1	.00	.00
Treatment x Class x Type	7.82	3	2.61	.29

Table 13

Summary of Analysis of Covariance on Measures of the Need for Academic Information Six Months After Treatment with the Pre-Test as a Covariate

(N = 173)

Source	SS	df	MS	F
Main effects				
Treatment	.97	3	.32	.25
Class	.29	1	.29	.23
Type	.86	1	.86	.67
Interaction				
Treatment x Class	7.09	3	2.36	1.86
Treatment x Type	5.31	3	1.77	1.39
Class x Type	1.57	1	1.57	1.24
Treatment x Class x Type	.45	3	.15	.12

two ANCOVAs. The first used pre-test scores from the preliminary study as a covariate. The second ANCOVA used post-test scores from the preliminary study as a covariate. The results of the first ANCOVA are presented in Table 14.

As Table 14 clearly indicates, there were no significant main effects. However, a significant class by type interaction was found. This interaction can be explained by reviewing Figure 2. It is evident from this table that there is a significant difference between freshmen and sophomores in the people oriented category.

The results of the second ANCOVA are reported in Table 15. This table indicates that while no significant main effects were found, a significant class by treatment and class by type interaction was found. Figure 3 clearly demonstrates the differences between freshmen and sophomores across the various treatments. Based on the findings from these two ANCOVAs, Hypothesis 5 was rejected.

Hypothesis 6.

The final hypothesis of the present study stated that there would be no significant difference by treatment mode, class or personality type in the predictive validity of the Colorado Educational Interest Indicator (CEII) as measured by the agreement between majors denoted as an excellent choice on the CEII profile and the actual major selected by the subject. Since this hypothesis was concerned with the frequency with which subjects in the various groups selected majors the CEII had predicted as an excellent choice, it was decided that a Chi-square (X^2) analysis would be the most appropriate statistical method. This analysis

Table 14

Summary of Analysis of Covariance on Measures of Environmental or Personal Barriers Six Months After Treatment with the Pre-Test as a Covariate

(N = 173)

Source	SS	df	MS	F
Main effects				
Treatment	.10	3	.03	.11
Class	.08	1	.08	.28
Type	.21	1	.21	.75
Interaction				
Treatment x Class	2.06	3	.68	2.39
Treatment x Type	.25	3	.08	.29
Class x Type	1.99	1	1.99	6.95*
Treatment x Class x Type	.43	3	.14	.50

* $p < .01$

Figure 2

Plot of the Class By Type Interaction for Environmental Barriers Six Months After Treatment with the Pre-Test as a Covariate

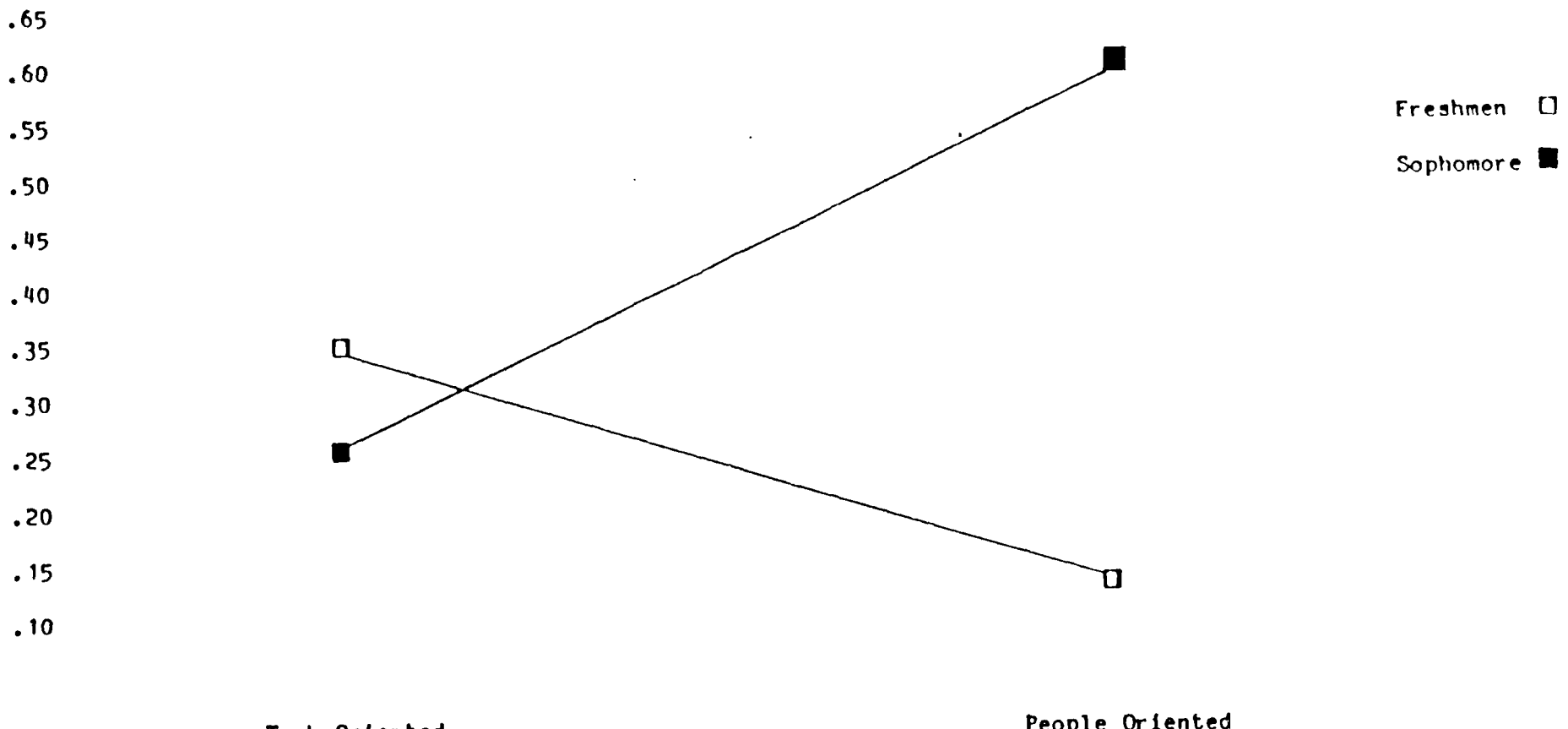


Table 15

Summary of Analysis of Covariance on Measures of Environmental or Personal Barriers Six Months After Treatment with the Post-Test as a Covariate

(N = 175)

Source	SS	df	MS	F
Main effects				
Treatment	.05	3	.17	.06
Class	.55	1	.55	1.88
Type	.005	1	.005	.02
Interaction				
Treatment x Class	3.02	3	1.01	3.43*
Treatment x Type	.93	3	.31	1.05
Class x Type	2.52	1	2.52	8.58**
Treatment x Class x Type	.53	3	.18	.60

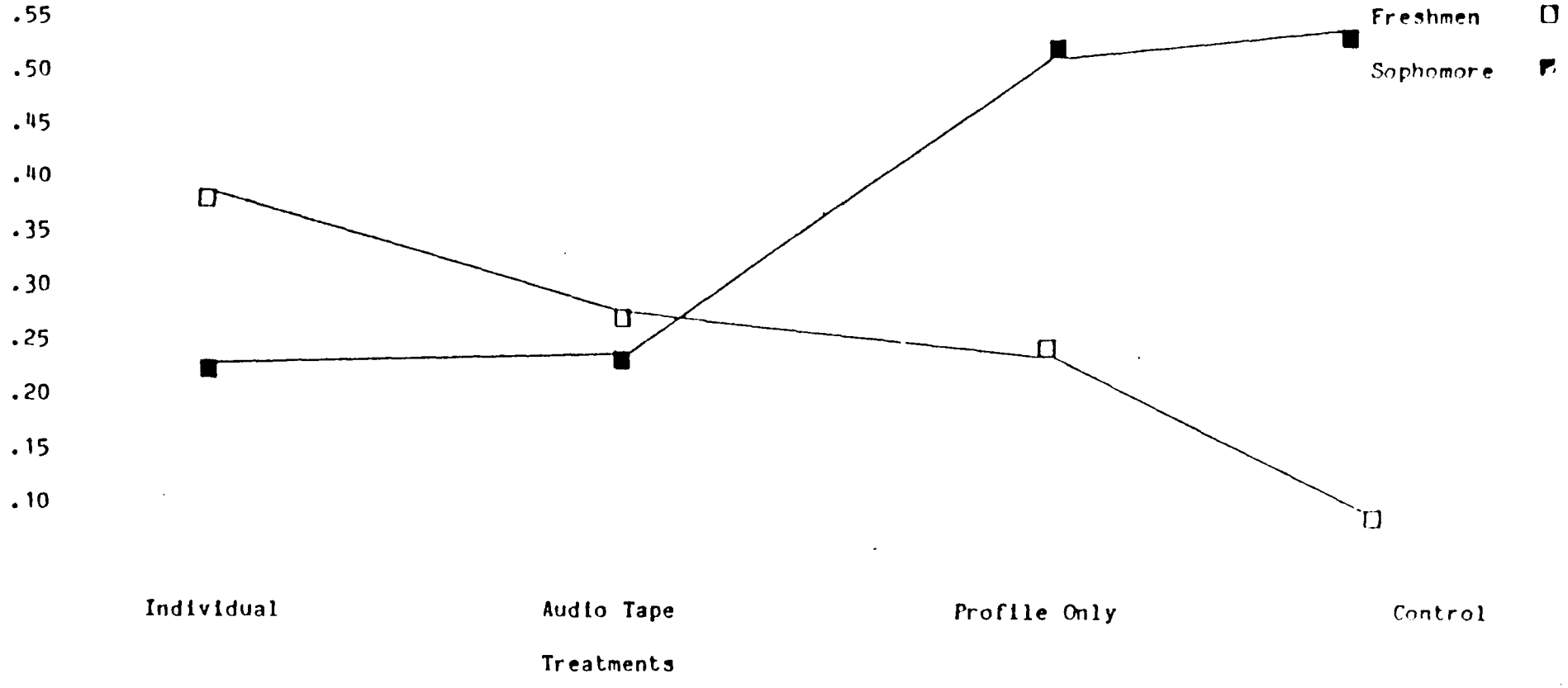
*$p < .05$

**$p < .005$

Figure 3

Plot of the Class by Treatment Interaction for Enviornmental Barriers

Six Months After Treatment with the Post-Test as a Covariate



found that there were no significant differences by treatment mode, class or personality type in the predictive validity of the CEII. The results of these analyses are reported in Tables 16 through 18. Based on these findings, the null hypothesis could not be rejected. It is important to note that the CEII is a highly predictive instrument. 61.8% of the subjects in this study selected a major that the CEII had predicted as an excellent choice two years prior to the actual selection.

Post Hoc Analyses

The first analysis that was performed was concerned with determining the cost of providing the three active treatments. Performing a cost analysis in a military environment was a difficult task due to the complex military pay structure. Military personnel are paid based on a seven days a week, 24 hours a day formula. However, for the sake of this analysis, counselors' pay was based on a 40 hour work week assumption. Using this assumption, it was determined that the counselors who provided the treatments in this study were being paid $13.00 an hour. Since each counselor recieved two hours of training and there were eight counselors, the cost of providing this training was $208.00. Additionally, the person who trained these eight counselors was also receiving $13.00 an hour. For the eight hours used to train these counselors he received $104.00. An additional cost that was associated with providing the training to these counselors was the cost of instructional materials. These materials included sample CEII profiles for each counselor, copies of the interpretation script and a list of the subjects the counselors would see. It took the trainer four hours to compile all of these

Table 16

Chi-Square Analysis of the Hit Rate for the CEII by Treatment Mode Six Months After Treatment

(N = 219)

	Treatments				
Hit Categories	Individual	Audio Tape	Profile Only	Control	Row Total
MISS					
Count	6	9	3	7	25
Tot pct	2.7	4.1	1.4	3.2	11.4
LOW HIT					
Count	11	13	18	17	59
Tot pct	5.0	5.9	8.2	7.8	26.9
EXCELLENT CHOICE					
Count	41	30	31	33	135
Tot pct	18.7	13.7	14.2	15.1	61.6
					219
					100.0

$X^2 = 6.95$

df = 6

$p = .33$

Table 17

Chi-Square Analysis of the Hit Rate for the CEII by Personality Type Six Months After Treatment

(N = 170)

	Personality Types		
Hit Categories	People oriented	Task oriented	Row Total
MISS			
Count	10	9	19
Tot pct	5.9	5.3	11.2
LOW HIT			
Count	21	24	45
Tot pct	12.4	14.1	26.5
EXCELLENT CHOICE			
Count	33	73	106
Tot pct	19.4	42.9	62.4
			170
			100.0

$X^2 = 5.29$

df = 2

$p = .07$

Table 18

Chi-Square Analysis of the Hit Rate for the CEII by Class Six Months After Treatment

(N = 219)

	Class		
Hit Categories	Freshmen	Sophomores	Row Total
MISS			
Count	15	10	25
Tot pct	6.8	4.6	11.4
LOW HIT			
Count	25	34	59
Tot pct	11.4	15.5	26.9
EXCELLENT CHOICE			
Count	60	75	135
Tot pct	27.4	34.2	61.6
			219
			100.0

$X^2 = 2.40$

df = 2

$p = .30$

materials. The materials cost only $4.00. The time used to collect and duplicate them came to four hours and this time cost $52.00. This raised the total training cost to $368.00.

In addition to the cost of training counselors, the cost of materials used to assess the treatments was computed. Processing 180 profiles for the CEII (active treatments only) cost $450.00. This was a one time cost because the profiles were provided to subjects only once. The blank audio tapes that were used in the audio tape treatment cost $3.70 each or a total of $7.40. The Career Decision Scale was administered three times during the research program. These instruments cost $135.00. The permission to modify and use Holland's My Vocational Situation cost $75.00. No cost was associated with using Holland's Vocational Preference Inventory since these instruments were already on hand. However, if they had been purchased the total cost would have been $61.50. The cost of producing 240 cards which served as the information request card, came to $15.00. The total cost of materials came to $743.90. The total cost of training and materials came to $1,111.90.

Once the initial outlays for training and materials were computed the actual cost of providing the treatments was assessed. It is important to note that this cost analysis is for the entire research program (preliminary study and present study). The cost of providing the individual treatment consisted of several factors. The first factor was the salaries of the eight counselors who participated in this study. (1) Each counselor spent approximately 3.75 hours providing feedback to subjects. At $13.00 an hour this came to $390.00. (2) Sixty CEII

profiles were used in this treatment at a cost of $150.00. (3) One hundred eight Career Decision Scales were used at a cost of $36.00. (4) The cost of providing the My Academic Situation checklist and the Information Request Card for this treatment was $30.00. The cost of providing the Vocational Preference Inventory was $15.47. This included test booklet profiles and answer sheets. The total cost of providing this treatment was $621.47. Based on this cost analysis it was determined that the cost per subject of providing the individual treatment on an ongoing basis was $3.67 to process the CEII profile. (The cost increases as the number of profiles processed decreases.)

.06 for each Career Decision Scale

.10 for each My Academic Situation Checklist

.05 for each My Academic Behavior Checklist

.26 for each Vocational Preference Inventory

$13.00 an hour for a counselor to interpret the results

$17.14 per subject.

The cost of providing the audio tape treatment was also divided among several factors. (1) The cost of the two counselors making the audio tapes (one hour for each counselor). (2) The cost of providing the actual treatment. (3) The cost of materials. Since each counselor spent one hour making the audio tapes the total cost of doing this was $26.00. The cost of providing the treatment was also $26.00. The cost of materials in this treatment were the same as the individual treatment except that there was an additional $7.40 cost to cover the price of the audio tapes. Based on this assessment the total cost of providing this

treatment was $264.87. The actual cost per subject of providing this treatment on an ongoing basis was:

3.67 for each CEII profile

.06 for each Career Decision Scale

.10 for each My Academic Situation Checklist

.05 for each My Academic Behavior Checklist

.26 for each Vocational Preference Inventory

.43 an hour for a counselor to make the audio tape and administer the treatment to 30 subjects (based on a $13.00 an hour salary)

$4.57 TOTAL

The cost of providing the Profile Only treatment was also divided among several factors. The first of these was the counselors' salaries. Since each counselor (total of two) spent only 30 minutes with their groups the cost related to salaries was only $13.00. The cost of materials needed to provide and assess this treatment were very similar to the other two treatments. The cost of the CEII profiles was $150.00. The total cost of the Career Decision Scales used in this treatment was $36.00. The cost associated with providing the My Academic Situation checklist and the Information Request Card came to a total of $30.00. The cost of providing the Vocational Preference Inventory was $15.47. Considering all of these factors the total cost of providing the Profile Only treatment was $244.47. Based on the analysis the actual cost per subject of providing this treatment on an ongoing basis was:

3.67 for each CEII profile

.06 for each Career Decision Scale

.10 for each My Academic Situation Checklist

.05 for each My Academic Behavior Checklist

.26 for each Vocational Preference Inventory

.22 a half hour for a counselor to pass out the profiles and wait for the subject to review the results

$4.36 TOTAL

Since the results which have been previously stated clearly show that personality type was not a significant main effect for any of the areas of interest, it was decided that post hoc analyses would be performed that excluded personality type from the analysis. This procedure allowed a significant increase in sample size to occur. This increase in sample size occurred because subjects that had been excluded from the analysis because they had not completed the Vocational Preference Inventory, had resigned from the Academy during the six month follow-up period, or had not been classified by Holland type as people oriented or task oriented were now included in the analysis. This procedure accounted for an increase of about 60 subjects in the preliminary study and about 30 subjects in the present study.

Information Seeking Behavior.

In the first post hoc analysis related to the preliminary study, an analysis of covariance was performed in which the sample size was increased from 176 to 238. The results of this analysis were similar to the original preliminary study analysis. A significant main effect for

treatment mode was found ($p < .01$). No other main effects or interactions reached significance.

The post hoc analyses that were performed relating to the present study and information seeking behavior (ANCOVAs) increased the sample size from 174 to 207 in the first analysis and increased the sample size from 173 to 206 in the second analysis. These analyses were identical to the original analyses reported in Tables 8 and 9 except that personality type was excluded. The first ANCOVA which measured information seeking behavior six months after treatment using the pre-test scores from the preliminary study as a covariate provided additional support for the original findings. In this analysis a significant main effect for class was found ($p < .01$). This was the same significance level that was reported in Table 8. No other main effects or interactions reached significance.

The second ANCOVA that was performed assessed information seeking behavior six months after treatment using the post-test from the preliminary study as a covariate. Unlike the original analysis, this analysis found a significant main effect for class and treatment mode. The results of this analysis are reported in Table 19. In addition, the means, standard deviations and effect sizes by class and treatment are reported in Table 20.

Certainty of Choice of Major.

The post hoc ANCOVA that was performed regarding the preliminary study raised the number of subjects from 177 to 240. This analysis like

Table 19

Sumary of Analysis of Covariance on

Information Seeking Behavior by Treatment Mode and Class

with the Post-Test as a Covariate

(N = 206)

Source	SS	df	MS	F
Main effects				
Treatment	3567.44	3	1189.14	2.68*
Class	133457.61	1	133457.61	30.39**
Interaction				
Treatment x Class	1347.08	3	449.02	1.01

*$p < .05$

**$p < .001$

Table 20

Means, Standard Deviatiaons and Effect Sizes by Class and Treatment on Measures of Information Seeking Behavior Six Months After Treatment

(N = 206)

Class	Mean*	SD	ES
Freshmen	40.51	22.30	
Individual	38.77	22.62	-.20
Audio tape	38.40	23.88	-.21
Profile only	42.00	22.13	-.05
Control	43.16	21.79	
Sophomores			
Individual	25.62	22.84	
Audio tape	23.66	19.65	-.26
Profile only	20.04	17.87	.002
Control	29.20	21.16	-.43

*Adjusted Means

the original found a significant main effect for class ($p < .01$). No other main effects or interactions reached significance.

In terms of the present study the post hoc analyses found a significant main effect for class ($p < .01$). No other main effects or interactions reached significance.

Academic Identity.

A post hoc ANCOVA was performed on data related to the preliminary study. This analysis increased the number of subjects from 175 to 238. However, the results of this analysis were similar to the original analysis. A main effect for class was found ($p < .01$). However, this was a far more significant result than that which was reported in the original data.

The post hoc analysis that was performed on data related to the present study increased the sample size from 175 to 208. The ANCOVA that was performed used post-test scores from the preliminary study as a covariate. This procedure allowed the researcher to assess potential gain scores between the three week after treatment evaluation and the six month after treatment evaluation. This analysis like the original analysis found no significant main effects or interactions.

Need for Academic Information.

The post hoc analysis that was performed on data from the preliminary study increased the sample size from 175 to 238. This analysis used pre-test scores from the preliminary study as a covariate. This analysis unlike the original analysis found a significant main

effect for class ($p < .01$). The means and standard deviations for each class are reported in Table 21.

The post hoc analysis related to the present study increased the sample size from 173 to 206. However, this ANCOVA like the original ANCOVA resulted in no significant main effects or interactions.

Environmental or Personal Barriers.

The post hoc analysis that was performed on data from the preliminary study increased the sample size from 175 to 238. In the original analysis a significant class by treatment interaction was found. However, in the post hoc analysis in which personality type was excluded and the power was increased, no significant main effects or interactions were found.

In the post hoc analysis which was related to the present study, the exclusion of personality type allowed the sample size to be increased from 175 to 208. The ANCOVA that was performed used the post-test from the preliminary study as a covariate. This analysis yielded no significant main effects but a significant class by treatment interaction was found. This finding would appear to support the class by treatment interaction that was found in the original analysis.

Additional Analyses

The following analyses represent areas of interest in the current study which had no stated hypotheses. These analyses are presented solely for exploratory purposes.

The first area of interest was related to the satisfaction that subjects in the various groups expressed in their choice of major three

Table 21

Means and Standard Deviations by Class on Measure of the Need for Academic Information Three Weeks After Treatment

(N = 238)

Class	M*	SD
Freshmen	2.30	1.48
Sophomores	1.06	1.33

$F = 10.65$

$p < .005$

Adjusted Means

weeks and six months after treatment. Using ANCOVA procedures, a significant main effect for class was found at the three week after treatment point in time ($p < .01$). The means and standard deviations for each class are provided in Table 22.

It must be noted that scale for satisfaction with major ranges from 1 which indicates "very satisfied with choice of major" to 5 which indicates "very dissatisfied with choice of major." Table 23 indicates that sophomores were significantly more satisfied with their choice of major three weeks after treatment than freshmen. No significant main effects or interactions were found six months after treatment.

A second area of interest was related to the number of majors being considered three weeks and six months after treatment. These areas were analyzed using ANCOVA procedures. Once again a highly significant main effect for class was found three weeks after treatment ($p < .01$). The means and standard deviations for each class are provided in Table 23. A highly significant main effect for class was also found six months after treatment ($p < .01$).

The means and standard deviations for each group are listed in Table 24. It was apparent from this data that freshmen were considering significantly more majors than sophomores six months after treatment.

Table 22

Means and Standard Deviations by Class on Measures of Satisfaction with Major Choice Three Weeks After Treatment (N = 240)

Class	M*	SD
Freshmen.	3.42	1.78
Sophomores	1.55	1.03

$F = 34.57$

$p < .001$

*Adjusted Means

Table 23

Means and Standard Deviations by Class on Measures of the Number of Majors Being Considered Three Weeks After Treatment (N = 240)

Class	M*	SD
Freshmen	2.97	1.27
Sophomores	1.72	.93

$F = 28.19$

$p < .001$

*Adjusted Means

Table 24

Means and Standard Deviations by Class on Measures of Number of Majors Being Consiered Six Months After Treatment

(N = 176)

Class	M*	SD
Freshmen	1.86	1.01
Sophomores	1.21	.59

$F = 17.70$

$p < .001$

*Adjusted Means

CHAPTER FIVE

Discussion

Since this research program consisted of two parts (preliminary study and present study) it was necessary for this researcher to devise a format for discussing these studies that recognized the uniqueness of each study while acknowledging the overlap in areas of concern. It was decided that each area of concern would be discussed by first addressing questions related to the results of the preliminary study. This discussion was followed by a discussion of questions related to the present study. It was believed that this format would provide a less confusing method of discussing the overall research program.

Information Seeking Behavior

The first observation that was made concerning this area was the lack of any significant difference between the three treatments (individual, audio tape, profile only). The significant treatment effect that was reported three weeks after treatment was due to the difference between the control group and the other three treatments. This finding supported the conclusion of Spokane and Oliver (1982) which stated "clients receiving a variety of alternative treatments are on the average better off than 59% of untreated controls." Even though there was no significant difference between the three treatments, it was interesting to note that the treatment with the largest effect was the Profile Only treatment. This finding was interesting because earlier research which was conducted in this environment by Bryant (1982) indicated that subjects in this setting found structure and contact with authority

figures as important variables in legitimizing tasks the subjects wanted to accomplish. However in the preliminary study the treatment with the least structure and individual contact with an authority figure had the largest effect size. Whether or not this inconsistency proves to be significant in future research remains to be seen. The fact remains that subjects who received any of the three active treatments reported seeking more information than the non-treatment control group. This would appear to be an endorsement for continuing some form of these treatments.

With regard to information seeking behavior six months after treatment, no significant main effects related to treatment mode or personality type were found. However a significant effect for class was found. Freshmen six months after treatment were reporting seeking significantly more academic information than sophomores. These findings would seem to indicate that freshmen in this setting have a greater need for academic information than sophomores six months after treatment. The obvious explanation for these findings it that at the time of the six month follow-up all of the sophomores had officially declared an academic major and therefore perhaps saw little need for academic information. In addition, it is highly probable that at the six month follow-up the sophomores had stopped seeking information. Tables 2 and 22 indicate the effect size of treatments and class. It is clear that the negative effect sizes reported six months after treatment can in some ways be attributed to a reduction in information seeking by participants. This statement can be supported by reviewing the means and standard deviations for each class on measures of self-reported information seeking behavior.

It must be remembered that at the conclusion of the preliminary study there was no significant difference between classes. The freshmen mean and standard deviation were 45.32 and 21.42. The sophomore mean and standard deviation were 45.26 and 23.94. However six months after treatment the freshman mean and standard deviation were 40.51 and 22.30. The sophomore mean and standard deviation were 25.62 and 22.84. This was a highly significant difference ($p < .001$). These findings clearly indicate that not only had the sophomores, who had declared an academic major reduced their information seeking but so had the freshmen who had not yet declared a major. Information seeking is particularly important in this environment because of the limited number of majors and the difficulty that subjects have in changing a major. Since it appears that subjects in this environment reduce their information seeking behavior significantly as they move toward making a choice of major perhaps the greatest benefit could be derived by providing academic interest inventory feedback to subjects early in their freshman year. This procedure would allow subjects the opportunity for the maximum amount of information seeking.

Certainty of Major Choice

In the preliminary study, the most striking findings related to this area was the extremely high level of academic certainty that the sophomores demonstrated at pre-test and three weeks after treatment. At the pre-test assessment sophomores' ratings on educational certainty had a mean of 3.04 with a standard deviation of .83. Three weeks after treatment the sophomore mean was 3.39 with a standard deviation of .78.

The maximum rating on this scale was a 4.0. It is possible that the highly selective entrance requirements and the institutional policies that force the selection of an academic major by spring break of the sophomore year are major factors in this high degree of certainty. In comparison, freshmen were significantly lower in certainty of major choice at pre-test and three weeks after treatment.

In the present study, measurement of the certainty of academic major choice six months after treatment reinforced the perception of the extremely high academic certainty that was originally found in the preliminary study. A significant main effect for class was found at six months after treatment. The real significance of this finding can best be understood when it is compared to another setting. Ospiow (1980, Appendix P-1) indicated that students at age 19 who completed the Career Decision Scale at a large eastern university scored an average of 2.92 with a standard deviation of .96 on the educational certainty measure. The sophomores in this study were all 18 or 19 years of age. Their academic certainty scores were 3.60 with a standard deviation of .61 six months after treatment. Based on this data it is clear that the sophomores in this study were a whole standard deviation higher in academic certainty than the students at the large eastern university. It is probably equally if not more important to note that the freshmen who participated in this study and who ranged in range from 17 to 18 we also higher in educational certainty than the students at the eastern university six months after treatment. This was not the case during the preliminary study (three weeks after treatment) or at pre-test. This

high level of educational certainty, so early in these subjects' academic career, would indicate that for any academic advisement or counseling program to have an impact, it must be introduced very early in these subjects' academic career, preferrably during the latter part of the first semester of the freshman year or very early in the second semester of the freshman year. Shipton and Steltenpohl (1981, p. 694) note the importance of gathering information about oneself and the external world if good educational planning is to occur. Since the subjects in this study were very certain of their educational major very early in their academic career it would probably be most advantageous to give these students as much information as possible as soon as possible. Perhaps an additional justification for providing very early academic advisement to these subjects was provided by research conducted by Goodson (1978). He indicated that there was a significant difference by college, i.e., business, education, engineering, in the way students approached the choice of a career and a college major. Of particular interest was his finding that the majority of students in the physical and math sciences choose their major before they choose a career. If Goodson's findings can be generalized to the setting of the present study, it might serve to explain some of the high educational certainty. Perhaps the students who participated in the present study came to this institution looking for the specific major that woud meet their needs since by the fact that they decided to come to this institution their career decision had already been made for them.

Academic Identity

In the preliminary study, measurements of this variable indicated a clear, logical and significant difference between freshmen and sophomores three weeks after treatment. Academic identify was defined as the possession of a clear and stable picture of one's goals, interests and talents. Table 4 indicates that there is a highly significant difference between freshmen and sophomores on measures of academic identity. This would appear to suggest that sophomores who participated in this study were much more certain of their goals, interests and talents than the freshmen who participated in this study.

In the present study, measurement of academic identity conducted six months after treatment yielded no significant main effects or interactions. This finding lends credence to the argument for the strong impact of environmental press in this setting. In the six months that elapsed between receiving treatments and assessing outcomes the freshmen became much more certain of their goals, interests and talents. At three weeks after treatment freshmen had a mean on this measure of 7.04 with a standard deviation of 3.90. At six months after treatment, freshmen had a mean on this rating of 4.29 and a standard deviation of 3.60. It should be remembered that the lower the score on this scale the higher the academic identity. Therefore this is a highly significant increase in academic identity for freshmen. No comparable increase occurred for sophomores. Their initial mean (three weeks after treatment) was 4.78 with a standard deviation of 3.84. At six months after treatment the mean was 3.43 with a standard deviation of 3.39. It can be seen from

these figures that the environment in which these subjects lived had a far greater impact on freshmen over time than it did for sophomores. It should be remembered that at six months after treatment there was no significant difference between the classes. Both classes at this point were indicating very high levels of academic identity. This is probably fostered by the nature of the institution in which this study occurred. The highly selective entrance requirements which guarantee a strong math and sciences orientation in students and the forced choice of a largely invariant academic major make it imperative that students in this environment quickly develop and maintain a clear sense of academic identity.

Need for Academic Information

In the preliminary study, the findings in this area were somewhat complex. Measures taken three weeks after treatment and compared by treatment mode, class and personality type found no significant main effects or interactions. However, when the same measurements were taken excluding personality type a significant main effect for class was found ($p < .01$). On the post hoc evaluation, freshmen were reporting a significantly greater need for academic information. Since the post hoc analysis was more powerful than the original analysis, it is this researcher's opinion that the post hoc analysis more accurately reflects the situation. Further justification for this opinion was found by reviewing the answers of these subjects to the individual items that made up the My Academic Behavior checklist. This review found that sophomores were reported talking to faculty members at a rate that was significantly

higher than that of the freshmen ($p < .05$). In addition, sophomores were reporting talking to their academic advisors at a rate that was significantly higher than that of the freshmen.

Another measure of the need for academic information that was used during the preliminary study was the Information Request Card. Only 36 of a possible 180 subjects returned this unobtrusive measure. Even with this low return rate it was possible to perform a Chi-square analysis of the return rate. This analysis found a significant effect due to treatment. Caution must be used in interpreting these findings. However, this analysis indicated that subjects who received the individual treatment returned this measure at a significantly higher rate than the subjects who received the other two treatments. This finding was a replication of the results reported by Hoffman et al. (1981). Based on this it would appear that the individual counseling treatment is the most effective means of encouraging information seeking in this setting.

On the surface the very low rate at which the Information Request Card was returned might be viewed as an indication that these subjects don't need this type of information. It is this researcher's opinion that nothing could be further from the truth. Using the individual responses to the My Academic Behavior checklist it was possible to gather some support for this opinion. Even though there was a significant difference by class on measures of the number of times subjects talked to faculty members and academic advisors about their possible major, the numbers were still very low. Three weeks after treatment, sophomores

were reporting talking to a faculty member only 3.1 times. Freshmen were reporting only 2.0 visits. The numbers were a little higher with regard to talking to an academic advisor. Sophomores were reporting 4.6 visits while freshmen were reporting 3.3 visits. The point that was obvious was that these subjects seek out authority figures (in this environment) for information at a very low rate. Clinical experience at this institution has found that these subjects often perceive requesting help from authorities as a sign of weakness. The environment in which this study occurred is highly competitive and these subjects have a tendency to keep as many of their perceived weaknesses as possibly secret. When this is not possible they turn to family and friends for information. In this study, these assumptions appear to have been supported. Subjects reported talking to their parents about their academic plans at a rate much higher than that of faculty members or academic advisors. The avereage number of talks for both classes was 5.64. Subjects reported talking to other students an average of 8.39 time. Based on these findings it appears quite likely that the extremely low return rate of the Information Request Card can be explained in terms of the subjects' reluctance to request or seek information from authority figures.

In the present study, even though no significant main effects or interactions were found on measures of the need for academic information six months after treatment, there were some finding that warranted discussion. First of all it should be recalled that at this point in time (six months after treatment) all of the sophomores had selected a major. In addition it should be noted that no Information Request Cards

were received later than two weeks after treatment. When the individual responses to the My Academic Behavior checklist were reviewed (post hoc) a clear pattern emerged. The sophomores who had already officially declared a major were reported seeking very little information. This was in keeping with their responses to the need for information scale on the My Academic Situation checklist. The freshmen however, were not reporting seeking significantly more information from faculty members and advisors. These freshmen had moved to a position along the need for information continuum that was very similar to where the sophomores had been six months prior. If as this data suggests, there is a tendency on the part of these subjects to wait until early in their sophomore year to begin actively seeking academic information from knowledgeable authorities, then this would seem to provide additional support for the opinion that these subjects need to be provided with information about themselves and their environment as early as possible. This would perhaps gives these students a greater probability of getting the information they need in order to make the best possible decision. Shipton and Steltenpohl (1981) argue for a comprehensive approach to career and educational planning. They stress the importance of providing experiences at points of transition in the students' lives. It would appear that the point of transition related to the need for academic information occurs very early for the subjects in this study. Perhaps a program of academic counseling or advising that sought to legitimize the need for information would counteract the prevailing attitude that

requesting information is a sign of weakness. Additional research is needed in this area before any firm conclusions can be made.

Environmental or Personal Barriers

Based on the preliminary study, the first observation that was made concerning environmental or personal barriers in the preliminary study was that there were no significant main effects in this area three weeks after treatment. This was somewhat of a surprise since clinical experience has indicated to this researcher that significant others (parents and faculty) have a large impact on the selection of a major in this setting. The present data clearly does not support this opinion. Perhaps this researcher's experience has led him to erroneous conclusions. Another possibility is that the instrument used to measure area was not sensitive enough to detect these potential differences.

Even though no significant main effects were found, a significant class by treatment interaction was found. As can readily be seen by examining Figure 1, the mean number of environmental barriers was less than one for all groups. It was also evident that the subjects in the individual treatment and the control group accounted for the significant interaction. Sophomores in the individual treatment group reported experiencing more environmental or personal barriers than the freshmen who received that treatment. However, freshmen who were in the control group reported experiencing more environmental or personal barriers than the sophomores in the control group. Additional research is needed to fully explain this interaction.

In the present study, two ANCOVAs were performed which were related to environmental or personal barriers six months after treatment. The first ANCOVA used pre-test scores from the preliminary study as a covariate. This analysis yielded no significant main effects. However, a significant class by type interaction was found. Figure 2 shows that while freshmen in the task oriented group reported slightly more environmental or personal barriers than sophomores in this group the sophomores in the people oriented group reported substantially more environmental or personal barriers than the freshmen in this group.

The second ANCOVA that was performed in this area was designed to assess potential gain scores between the post-test of the preliminary study and the six month follow-up evaluation. This analysis, like the previous one, found no significant main effects. A significant class by type and class by treatment interaction was found. The findings related to the class by type interaction were reported in Figure 2. A plot of the class by treatment interaction is provided in Figure 3. This graph indicates that freshmen in the individual treatment reported experiencing more environmental barriers than did sophomores in this group. Freshmen in the audio tape treatment group also reported experiencing more environmental barriers than did sophomores who received this treatment. However, sophomores who received the Profile Only treatment and who were in the control group reported experiencing more environmental or personal barriers than the freshmen in these groups. It would appear that as individual counselor contact dropped, the environmental or personal barriers for sophomores increased. The opposite was true for freshmen.

It is possible that Figure 3 reflects where each class was in terms of making its academic choice. It could be that the sophomores who had already made a choice of major found that the information provided by the individual and audio tape treatments allowed them to be more sure of their choice and therefore avoid environmental barriers. As these sophomores moved toward less structure in the Profile Only treatment and the control group, they became more susceptible to potential environmental or personal barriers. The opposite appears to be true for freshmen. Before any firm conclusions can be made about the effects of the various treatments and class membership on environmental or personal barriers, additional research is needed. In addition, expansion of the scale that measures environmental barriers would have to occur.

CEII Predictive Validity

Since this area of concern was associated only with the present study, no preliminary study data is available. The Chi-square analyses that were performed clearly indicate that there were no significant differences by treatment mode, class or personality type on measures of the predictive validity of the CEII. The present study has provided additional support to the claims of high predictive validity for the CEII. 61.8% of the subjects who took the measure during the first week of basic cadet training selected a major (two years later) that the CEII had predicted as an excellent choice. It is important to understand that in the setting in which this study occurred there are only 24 possible majors and that the majority of these are related to math and sciences. Due to this restricted range of majors it is possible that the high hit

rate of the CEII could be attributed to possible overlap in the possible majors. It is important to note that giving subjects academic feedback concerning the CEII did not in this setting increase the predictive validity of the measure. This finding seems to raise the question: Why use this measure when the students appear to be making an appropriate choice without it? The best answer this researcher could arrive at was that the instrument does more than just predict a major. It is possible tht the CEII serves as a means encouraging students to explore all their options. Perhaps the instrument legitimizes the struggle that a student experiences as he or she moves toward making a choice of major. Satisfaction with the choice of major increased significantly for all classes as they moved toward making a major choice. The CEII is obviously not a panacea, but in this setting where most academic information comes from friends and parents, it is the one systematic approach to providing academic interest feedback. It gives subjects the chance to compare their stated interests with those of students who were successfully completing a variety of majors. In a setting where the average number of majors considered is only 2.3, this is invaluable information. Perhaps the best use for the CEII in this setting would be to incorporate it into the existing advisement system.

Cost Analysis

The post hoc cost analysis that was performed demonstrated that the Profile Only and Audiotape treatments were significantly more cost effective on a per client basis than the Individual treatment. In addition, since very few significant treatment effects were found in this

study, it would appear that this study would justify using the most cost effective method (Profile Only). However, the clinical experience of this researcher would argue against using cost as the only selection criteria in this setting. As the My Academic Behavior Checklist indicated, subjects in this setting get the majority of their academic information from peers and parents. Since these two groups have such a major impact on students in this setting it would seem logical and justifiable to use a combination of the three treatments (Individual, Audiotape, Profile Only) in order to utilize this unofficial information network in the individual student's behalf. Perhaps establishing an advisement system that incorporates parents and that uses other students as paraprofessional advisors might be the most beneficial to students in this setting. However, these assertions will have to be substantiated through additional research.

Attribute By Treatment Interactions

This study found that the personal attribute "personality type" which was based on Holland typology, had little effect on the variables studied. There were two cases in which personality type interacted with class to form a significant effect. In both cases significant differences between the freshmen and sophomores in the people oriented group accounted for the significant interactions. However, this occurred on the measures of environmental or personal barriers. It has previously been indicated that this variable had very little impact on the selection of a college major.

It would be premature to minimize the impact of potential attribute by treatment interactions based on the findings of this study. The sample that was used in this study is potentially very different from samples that might be found at any other institution. Cadets come to the Air Force Academy specifically to become Air Force officers. In many ways the majority of them have made a vocational choice prior to attending their first class. This researcher may have made a mistake by administering these subjects Holland's Vocational Preference Inventory (VPI) in order to determine their Holland type. It is possible that the subjects in this study found the format of the VPI confusing. Since these students had already made an initial vocational choice being asked about vocations they liked may have appeared meaningless. Even with the potential flaw, only 16 of the 210 subjects who returned the six month follow-up assessment failed to fully complete the VPI. It is possible that an assessment device that could determine Holland type by comparing academic interests would have been far more likely to detect significant attribute by treatment interactions for this population. Cronbach and Snow (1977) indicated that it is often difficult to find significant attribute by treatment interactions when very few personal attributes are assessed. Perhaps using Holland type as the only attribute measure prevented potentially more significant attribute by treatment interactions from being found.

The subjects who participated in this study demonstrated a high degree of stability in terms of the areas studied in the present study. It would appear that a pattern exists in the way that freshmen and

sophomores approach selecting an academic major. As time elapsed the freshmen behavior patterns, i.e., information seeking, academic identity and need for academic information became increasingly more similar to that of the sophomores. It would appear that the environmental press that operates in this environment has a significant impact on cadets very early in their cadet career. This environmental press may have also contributed to the small number of significant findings. The significant findings that did occur were largely attributable to differences between the two classes. One note of caution must be made. The present study incorporated many different analyses of covariance. In any study in which many analyses are performed there is an increased chance of a Type I error. This study is no exception. There is a possibility that all of the significant findings that were reported in this study were due to Type I error. In this researcher's opinion, this possibility was small. No more than two ANCOVA's were performed on any area of interest to the present study. It would be highly unlikely that these analyses would result in a significant increase in Type I error.

Summary.

The results of this research study are vastly different from much of the earlier research that was conducted in the vocational area and suggest that with few exceptions, treatment mode and personality type had little effect on the measurements of interest. Class, however, consistently related to significant differences.

Even though these findings are different from those reported in earlier research (Hoffman, Spokane & Magoon) they appear to be logical

when the environment in which the research occurred is considered. Perhaps Kurt Lewin's (1951) definition of behavior proves a framework in which the findings of this study can be understood. Lewin stated that behavior is a function of the person interacting with the environment (B=F(PXE)). It would appear from this research that the class membership of these participants was a major influence in their educational decision making process. Murray (1938) explained this process in terms of beta press.

Walsh (1973) defines beta press as "consisting of a private as well as consensual press. The private beta press refers to the unique and private view of each person of the events in which he takes part, while the consensual beta press refers to the interpretation of events which are common, mutual and shared by people who are participating in these events" (p. 100). It would appear that this consensual beta press had the greatest impact on the educational decision making activities of the participants in this study. Cadets in this institution have a strong sense of comradeship within their class. Privileges and punishments are given out based on class membership. In addition, adherence to rules and regulations is most often influenced by peer pressure from classmates. In this setting, it is quite possible that the behavior and opinions of classmates far outweigh the feedback provided by any questionnaire or authority figure. The fact that both freshmen and sophomores sought significantly more academic information from their parents and other students than they did from possibly more knowledgeable sources would seem to support this premise.

Perhaps the nature of the curriculum in which these students operate also influenced the results of this study. As it was mentioned earlier, Chickering (1969) describes curricula similar to the Academy's as a "rocket curriculum." He explains that in this curriculum the choice of routes is limited and changing courses is difficult without leaving the system. He further states that throughout training, dependence on others is great. It would appear that this type of curriculum would provide little opportunity for long term exploration or individual approaches to decision making. If this is in fact true, then the results of this study make perfect sense. The class is the accepted unit of operation. Behavior that goes along with the class norm is accepted and reinforced. Individual approaches to decisions based on mode of treatment and personality type are perhaps viewed as high threat activities and are therefore avoided. These type activities are most often rewarded outside of this environment and are therefore most often practiced there.

Even though environmental press was very important in this study, some other variables were also important explanations for the differences between the classes. One particular area of impact was the difference in motivation between the freshmen and sophomores who participated in this study. It is possible that as the level of maturity increased the academic behavior of the participants also changed. Chickering (1969) discusses this maturation process in terms of achieving competence, managing emotions, becoming autonomous and establishing identity. He describes the entire process as one that encompasses moving from one "vector" to another based on how well the developmental issue of the

previous vector was accomplished. It is possible that differences in level of development between freshmen and sophomores accounted in part for the significant differences between classes.

In this setting, perhaps the best way of truly assessing the effectiveness of the various treatment modes and personality types would be to redesign this study using cadets of the same class as the trainers. If they provided the treatments, under professional supervision, it is possible that significant treatment and personality type differences would be more likely to be found.

Limitations

As in any field study, what a researcher gains in terms of generalizability is often paid for in terms of experimental control. This field study is no exception. Perhaps the greatest limitation of the overall research program was the inability of this researcher to randomly assign subjects to treatments. Subjects were randomly assigned to treatments based on squadron membership. Since cadets in this setting do everything according to their squadron membership, it was decided that the risk of contaminating treatments would be significantly reduced by assuring that all of the subjects in a single squadron received the same treatment. It was believed that this procedure would prevent cadets in the control group from feeling that they were being denied adequate information. Campbell and Stanley (1963) discuss the need to control for internal threats to validity. The assignment process used in this study allowed the researcher to control for a potential threats due to history and instrumentation.

A second limitation of this study was the exclusion of women from the sample. Since women did not attend the Academy until 1976, it was not possible at the inception of the present study to develop female norms for the CEII. Due to the small number of women in some of the more technical majors and the lack of data to support the use of male norms with women, the decision was made to exclude women from this study. Therefore, all findings in this study can only be generalized to the males at the Air Force Academy.

Another limitation of this study was the relatively short treatment time that was associated with all the treatments. All of the subjects in this study who received an active treatment had exactly 30 minutes of treatment. It is quite possible that for some of these subjects this was too short of an exposure. Shipton and Steltenpohl (1981) indicated that there is a movement away from the "test them and tell them" approach to educational planning. They further indicated that advisement needs to be seen as a developmental process. In order for this process to occur, students must be provided information in a sequential manner that recognizes their differing informational needs and their differing readiness for information. It is possible that the present study violated these assumptions. In fact, it is possible that the limited amount of contact that these subjects received was not seen as important enough by these subjects to elicit efforts that might have occurred as the duration of the treatment contact increased.

Future Research

As it was stated in Chapter One, no research was found which investigated the impact of providing academic interest inventory feedback to college students using differential modes. Additionally, no studies were found that assessed the impact of personal attributes of subjects on their response to receiving academic interest inventory feedback. Due to the somewhat unique nature of the sample upon which this study was conducted a replication of this study is needed in an environment in which subjects represent a wider range of the entire college student population. In addition, replication is needed in a setting in which the number of possible majors is significantly greater than that represented in the present study.

In order to facilitate any future attempts to replicate this study the pretest, posttest and six month follow-up means and standard deviations are listed in Appendix G.

The area with perhaps the greatest potential for additional research is related to assessing whether the cost of developing local norms for the CEII is warranted in terms of a higher hit rate than that produced by using the national norms.

Another area of potential research is related to assessing the potential differences by gender in responses to receiving academic interest feedback using several modes. Earlier research by Krumboltz and Thoresen (1964) found significant treatment effects based on geneder. In particular, different treatments had significantly different effects on information seeking behavior for men and women. Current research is

needed to assess the effects that gender has on outcome measures related to the effect of receiving academic interest feedback.

Another possible area of future research is related to recent exploratory studies conducted by Taylor (1983) at the University of Colorado. The preliminary findings have indicated that it may be possible to develop a unisex version of the CEII. The early findings have indicated that using a combination of male and female norms does not seriously or significantly reduce the predictive validity of the CEII for women. Future research is needed to further substantiate these preliminary findings.

The research program that has been described on the preceding pages represents an introductory step in the area of assessing the impact of giving academic interest feedback using multiple modes and in assessing this impact over time. In addition, it provided an initial assessment of the effect that a specific subject attribute (personality type) would have on the treatments provided participants. Much additional work is needed in this area. It is the hope of this researcher that these studies will encourage others to continue this long overdue exploration.

APPENDIX A

Script for Individual and Audio Tape Treatments,

CEII Test Booklet, Answer Sheet and Sample Profile

Script for CEII Interpretation

During the first few days of your Basic Cadet Training, you took the Colorado Educational Interest Indicator, referred to as the CEII. (Show the booklet and answer sheet.) I hope that you recall filling out this inventory because today we are going to talk about what the results mean.

The CEII is an interest indicator based on educationally related items which will indicate your strongest areas of educational interest regardless of your aptitude, achievements or grades.

The CEII scales and norms were constructed from data collected from Air Force Academy cadets. Thus, your scores show how your educational interest patterns compare to those of first and second class cadets.

You cannot fail this indicator, because there are no right or wrong answers. Remember, it measures only your educational interests and not your aptitude or achievement.

All scores are reported in percentiles which have a range of 1-99. Your percentile score indicates the percent of upper class cadets who scored lower than you. For example, a percentile score of 90 means that 90 out of 100 cadets scored below you and, thus, you would interpret a 90 as a very high score. For your convenience, all scores have been rank ordered and listed in columns with headings which interpret the meaning of your score.

Now read with me from your sample CEII profile. At the top of the profile sheet you will see: "Your interest pattern was compared to the interest of AFA men students who have completed over 80 percent of their academic programs. The higher your score the more similar your interest

pattern is to the interest pattern of students majoring in that area. A high score indicates that the subject would be interesting, but not necessarily easy for you. Your highest scores appear on the right. Caution = Carefully investigate each of your high major scores before choosing the one most appropriate for your unique situation. The majors with low scores are printed on the left side. You showed a strong dislike for them." The students majoring in a specific subject achieve an average percentile score of 90 on that major scale.

Academic Major Scales

For Sample Sam, six academic majors appear in the "Excellent Choice" category (i.e., computer-sci, math). Likewise, an additional four academic majors appear in the "Like" category representing majors from Chemistry to History. The odds are 80 to 20 that Sample Sam will eventually graduate in one of the above majors and only 1 in 99 that he would select a major that was listed as a "Dislike" or "Active Reject." The real value of the Academic Major Scales is that you cannot fake them since they were developed from items that students in that specific major happen to like or dislike to a very high degree. The items that were chosen by the students in a specific major often do not have any direct relationship to the content of that major. Thus, these major scales may reveal to you some new fields of study to investigate or reinforce a major choice that you have already made. Since you like what the students in the high major scales like and dislike what they dislike, the chances are good that you would enjoy that subject area and possibly work hard at it thereby increasing your chances of success. Some high major

scales may not appeal to you and some may only be hobbies or pastimes; but, if you look for the themes like science, history or business that may run through your high scores, you will find some promising subjects to consider for your college major.

Educational Cluster Scale

Whereas you may have been surprised at some of your high or low academic major scales, you should readily recognize your high Educational Cluster Scale scores as outstanding areas of interest for you. These Educational Cluster Scales were developed by a statistical procedure called cluster analysis which sorts out all of the items that have similar content and combines them into a scale name for the most typical content. The more times you marked "like" on your answer sheet in regard to questions about that type cluster, the higher your cluster score will be. If you liked all kinds of activities, all of your cluster scores will be high.

High Educational Cluster Scale scores indicate that you liked most of the items closely related to the content of that specific scale. You disliked the items in your low score cluster scales. If you also try to find themes like technical, social and artistic interests among your Educational Cluster Scales, you will likely find some reinforcement for the themes you already discovered among your high Academic Major Scales.

Sample Sam had high Educational Cluster Scale interests in Physical Science, Philosophy and Mathematics, which were quite consistent with the themes found among his high Academic Major Scales.

Response Pattern Scores

The "Like pct=27" indicates that Sam marked 27 percent of his answers "Like." He also marked 6 percent "Indifferent" and 67 percent "Dislike." Sam marked all 399 responses in a readable manner. His Educational Level Scale (EDL) score was 61 which placed him in the 61 percentile. Thus, Sam was more interested than 61% of his peers in continuing his education. Students with EDL scores similar to Sam find graduate school an appealing option.

Form 1

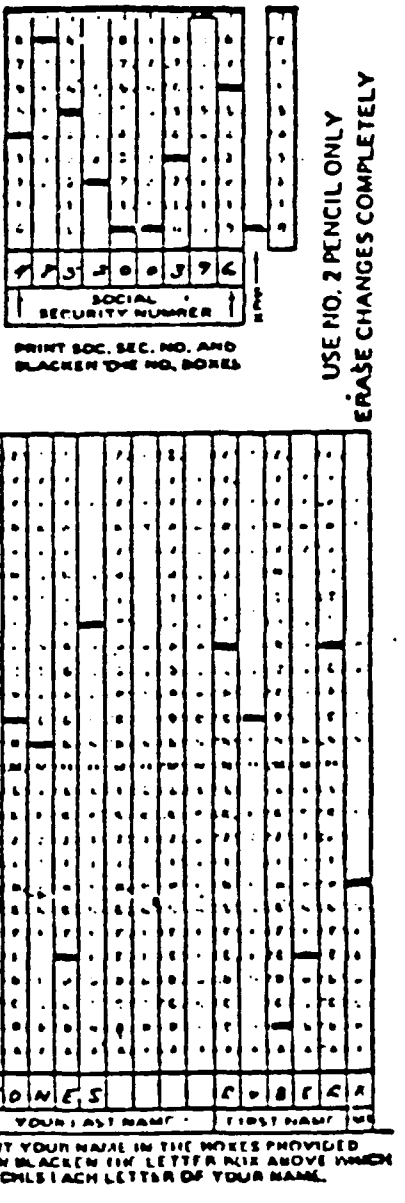
COLORADO EDUCATIONAL INTEREST INDICATOR

Robert D. Whetstone, Ph.D.
and Ronald C. Taylor, Ph.D.

The CEII is an educational interest inventory which will show you some areas of study that should appeal to you. It is not a measure of your abilities. Your answers will be compared to those of successful students in many subject matter fields and your scores will show how similar your interests are to theirs.

Directions

1. Use a number 2 pencil and write on the answer sheet only, not the CEII booklet.
2. Print your last name, first name, middle initial, and social security number on the answer sheet. Then mark the appropriate slot for each letter and number in the column above. See the example →
3. Mark whether you are Male or Female in the slot next to the social security number. This is essential since both sexes use the same answer sheet.
4. On the back of your answer sheet complete:
   A. current school if now enrolled or the name of your last school
   B. your major if in college
   C. your highest grade completed
   D. as much other information as you know.
5. Watch for changes in directions for marking your answer sheet before each section.
6. Answer every question carefully and quickly. Thoroughly erase an answer you change. Avoid wrinkling the sheet or marking outside the slots. You will not be timed but should finish in less than an hour.



DO NOT WRITE IN THIS BOOKLET

COLORADO EDUCATIONAL INTEREST INDICATOR

Form N

SECTION I-III. Course Titles

The following lists of course titles have been selected because of their relationship to major fields of study at the post-high school level. Your task is to read and respond to each course title by marking the appropriate space on your answer sheet using a #2 pencil. BE SURE TO ANSWER EVERY ITEM REGARDLESS OF HOW MUCH YOU KNOW ABOUT THE CONTENT.

L = LIKE I = INDIFFERENT OR CANNOT DECIDE D = DISLIKE

1. Nature studies
2. Watch repair laboratory
3. Salesmanship seminar (discussion)
4. Advanced calculus
5. Advanced machine shop
6. Landscaping techniques
7. Tax accounting
8. Earth science
9. Cartoon drawing
10. Sales training program
11. Care of the aging
12. Care of the physically sick
13. Ballet dancing
14. Jazz music
15. Business marketing
16. Sacred music
17. Game management
18. Business management
19. Varsity baseball
20. Business sales management
21. Labor relations
22. Farm management
23. Economic systems
24. Sculpture studio
25. Science research laboratory
26. Business advertising and promotion
27. Adult education
28. Modern mechanics
29. Business merchandising
30. Research report writing
31. Advanced tennis
32. Mechanical design
33. Geography of North America
34. General agriculture
35. Recreation administration
36. Neurological surgery
37. Advanced research statistics
38. Real estate seminar
39. Beef management
40. Recreational leadership
41. Secondary school administration
42. Heavy equipment operation
43. Research laboratory techniques
44. Personnel management
45. Dentistry laboratory
46. Religious studies
47. Merchandising and marketing
48. Technical writing
49. Religious education
50. Office management
51. Child care and development
52. General physiology
53. Advanced physics
54. Photography laboratory
55. Philosophy
56. General chemistry
57. Physical education
58. Pharmacy and drugs
59. History of World War II
60. Biblical literature
61. Biological evolution
62. Skiing
63. History of art
64. Business finance
65. Military science
66. Piano recital
67. Military training
68. Bird management
69. Fish management
70. Biblical studies
71. Military officer training
72. Mining principles
73. Life insurance seminar
74. Advanced library science
75. Higher education seminar
76. Civil engineering
77. Financial secretarial training
78. Reserve Officers Training Corp
79. Electrical engineering lecture
80. Electronics design

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81. Flight training
82. Electronics laboratory
83. American history
84. American government
85. Small business management
86. International problems and issues
87. The study of animals
88. English grammar and spelling
89. Industrial arts
90. English literature

91. Ancient languages
92. English composition
93. Industrial management
94. Industrial engineering
95. Interior design
96. International journalism
97. International relations
98. Woodworking shop
99. Police science
100. Business cost analysis

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101. Socialism
102. Comparative religions
103. Forms of religious worship
104. Horsemanship
105. Forestry
106. Counseling
107. Mountain climbing
108. Intermediate golf
109. Advanced sociology
110. Modern language

111. Solid geometry
112. Rocks and minerals
113. Bookkeeping
114. Tool and die making
115. Social work seminar
116. Computer technology
117. Journalism
118. Modern political systems
119. Poetry
120. Advanced corporate law

121. Court room procedures
122. Advanced modern language lab
123. Hotel-motel management
124. Advanced journalism
125. Money and banking
126. Political science
127. Advanced woodworking
128. Commercial pilot training
129. Opera singing
130. Speech and debate
131. Applied mathematics
132. Dramatics
133. Sports writing class
134. Communications
135. Public speaking
136. Advanced dramatics

137. Art masterpieces
138. Modern art
139. French cooking
140. Wrestling
141. Advanced art
142. Basic arithmetic
143. Principles of management by objectives
144. Principles of technical supervision
145. Criminology
146. Advanced writing workshop

147. Advanced criminal law
148. Creative design lab
149. Principles of art display
150. Principles of industrial management
151. Drafting and design
152. Novel writing lab
153. Architectural design
154. Drawing wild life
155. General psychology
156. The psychology of door to door selling

157. Advanced psychology seminar
158. Stocks and bonds
159. Student teaching
160. Study of stars and planets
161. Studio art
162. Musical masterpieces
163. Outdoor survival
164. Public administration seminar
165. Human diseases
166. Automotive mechanics

167. Advanced music conducting
168. Building trades
169. Government administration
170. Music education
171. Music recital
172. Principles of public relations
173. Executive secretarial training
174. Typewriting
175. Typesetting for printing press
176. Labor problems

177. Founders of modern science
178. Advanced physical education
179. Chemistry lab
180. Advanced algebra
181. Study of plant life
182. Elementary education
183. Play writing
184. Classical art
185. Plant research and development

SECTION IV. Educational Experiences

Respond Like, Indifferent or Dislike to the educational experiences below.

186. Direct a college play or program
187. Spend a vacation period on a large farm
188. Join the bridge club at college
189. Be a cheerleader at college football games
190. Join the school chess club
191. Play varsity team sports
192. Take a night course in flower arrangement
193. Work part-time in the campus bookstore
194. Work part-time in a mental hospital
195. Do library research

196. Work as an assistant in a physics lab
197. Take a course in police work
198. Spend a summer on an anthropological "dig"
199. Run for student government
200. Act in a college dramatic performance
201. Work part-time as a keypunch operator
202. Work part-time as a secretary
203. Work part-time in the gym
204. Take care of mice in an experimental lab
205. Work as a part-time computer operator

206. Write articles for the school paper
207. Do the art work for a homecoming float
208. Play in the college orchestra
209. Build a scientific instrument for a lab experiment
210. Write a scientific research paper
211. Write an essay exam
212. Tutor students for pay
213. Go on a nature study field trip
214. Take a multiple choice objective exam
215. Participate in student religious activities

216. Take a college level cooking class
217. Work part-time in a day nursery
218. Operate audio-visual equipment for a program
219. Weld a frame for a homecoming float
220. Try to fix your own watch
221. Prepare a speech for your club
222. Take an internship in the counseling department
223. Learn to tune up your own car or motorcycle motor
224. Sell encyclopedias door to door during vacation periods
225. Build your own study desk and furniture

226. Interview applicants who want to join your club
227. Learn first aid skills
228. Build your own hi-fi set
229. Work a summer on a large ranch
230. Work a summer in a greenhouse
231. Join the varsity debate team
232. Play in the marching band
233. Work in the library

SECTION V. Instructor Characteristics

Respond Like, Indifferent or Dislike to each instructor characteristic below.

234. Foreign accent
235. Interesting
236. Highly intellectual
237. Well organized
238. Strict grader
239. Strays from topic
240. Authoritarian
241. Liberal thinker
242. Conscientious
243. Challenging

244. Over 55 years old
245. Flexible
246. Scientific
247. Athletic
248. Graduate student without Ph.D.
249. Aggressive
250. Artistic
251. Respects ideas of others
252. Religious
253. Emphasizes ideas

254. Likes facts and details
255. Logical
256. Critical
257. Scholarly
258. Nonconformist
259. Aloof
260. Dresses fashionably
261. Highly emotional
262. Speaks from experience
263. Conservative

264. Practical
265. Philosophical
266. Profound
267. Realistic
268. Research oriented
269. Creative
270. Informal
271. Military mannerisms
272. Spontaneous
273. Famous in their field

274. Socialistic
275. Demands a lot of course work
276. Open minded
277. Very active in community affairs
278. Serious
279. Uses subjective tests
280. Optimistic

SECTION VI. Personal Preferences

Below are four sets of 10 items. Read each set of 10 items and mark on your answer sheet the 3 you prefer Most, the 3 you prefer Least, and the 4 remaining items "-".

M = MOST(3) "-" = OTHER(4) L = LEAST(3)

Ten Life Goals

281. Affection
282. Fame
283. Happiness
284. Independence
285. Power
286. Security
287. Self-esteem
288. Self-expression
289. Service
290. Wealth

Ten Life Virtues

291. Accuracy
292. Cleanliness
293. Goodness
294. Logical
295. Fairness
296. Self-control
297. Peacefulness
298. Industrious
299. Physical fitness
300. Truthfulness

Ten Life Values

301. Aesthetic-cultural
302. Economic-monetary
303. Educational-persuasive
304. Physical-athletic
305. Psychological-personal
306. Political-legal
307. Technical-mechanical
308. Scientific-engineering
309. Social-service
310. Spiritual-religious

Ten Life Styles

311. I want to do my thing
312. I always do the best I can
313. I like to do things by myself
314. I want to help people
315. I am very productive
316. I like to take high risks
317. I would rather follow than lead
318. I do most things spontaneously
319. I like to start new projects
320. I work hard for what I get

SECTION VII. Educational Preference

Mark on your answer sheet "L" if you prefer the Left item, "R" if you prefer the Right item and "-" if you cannot decide. Mark only one slot per pair of items.

L = LEFT ITEM "-" = CANNOT DECIDE R = RIGHT ITEM

321.	Indoor classes	Outdoor classes
322.	Two-year colleges	Four-year colleges
323.	Two-year colleges	Graduate schools
324.	Technical schools	Four-year colleges
325.	Mathematics classes	Language classes
326.	Literature classes	Science classes
327.	Large classes	Small classes
328.	Lecture classes	Laboratory
329.	Art	Physical education
330.	Industrial shop classes	Music classes
331.	Solving math problems	Solving social problems
332.	Business management	Typewriting
333.	Bookkeeping class	Speech class
334.	Objective multiple choice tests	Essay exams
335.	Term papers	Lab projects
336.	Assisting in the lecture	Assisting in the lab or shop
337.	Business sales class	Accounting-bookkeeping class
338.	Debate team member	Marching band member
339.	Chess team member	Football team member
340.	Cheerleader	Campus paper reporter
341.	Class secretary-treasurer	Class president
342.	Committee chairman	Committee member
343.	Working hard for A grade	Getting B with little effort
344.	Learn new physical skill	Learn new social skill
345.	Research projects	Final exams
346.	Oral reports	Written reports
347.	Independent studies	Large classes
348.	Discussion classes	Laboratory-shop classes
349.	Introductory classes	Advanced classes
350.	Field trip classes	Gym classes
351.	Drafting class	Dance class
352.	First aid class	Philosophy class
353.	Literature class	Calculus class
354.	Welding class	Religion class
355.	Animal topics	Political systems
356.	Typewriting	Social problems
357.	Law	Medicine
358.	Engineering	Mechanics
359.	Biology	Electricity
360.	Home economics	Business management

SECTION VIII. Educational Self-concept

The following statements refer to your self-concept. Mark on your answer sheet Yes for the ones which you honestly believe are true for you, mark the ones No that are not true for you and mark the rest "?".

Y = YES "?" = REMAINDER N = NO

361. My verbal ability is well above average
362. My mathematical ability is well above average
363. I can solve most mechanical problems easily
364. I can organize information very well
365. I have studied two or more foreign languages seriously
366. I am able to do tedious or detail work well
367. I can work well with most tools
368. I like to operate most machines or equipment
369. I can work numerical problems effectively
370. I have helped several people solve their problems

371. I can figure out most sets of instructions
372. I catch on to new procedures quickly
373. I have an excellent memory
374. I have a creative mind
375. I am well coordinated physically
376. I am left handed
377. I work well with ideas
378. I can read very well
379. I am an excellent speller
380. I am good at presenting information to others

381. I can help groups to make decisions
382. I am in the top 10 per cent of my class
383. I am on time with my class work
384. I am a highly organized person
385. I enjoy solving mathematic problems
386. I do well in art classes
387. I do well in physical education classes
388. I play at least one musical instrument well

Below are 11 statements that characterize you as a student. Mark on your answer sheet the choice (1, 2 or 3) that describes you best for each statement.

389. I usually get my best grades on school (1) tests (2) term papers (3) projects
390. I am careful about little details (1) most always (2) sometimes (3) very seldom
391. In my class I am in the (1) top quarter (2) second highest quarter (3) bottom half
392. I can "get over" failures (1) very easily (2) fairly easily (3) with difficulty
393. When caught making an error I usually (1) make excuses (2) play dumb (3) admit it
394. For me, a college degree is (1) not important (2) important (3) very important
395. I would like most to become (1) famous (2) popular (3) wealthy
396. I would like most to achieve an award in (1) music (2) science (3) business
397. I like to be the center of attention (1) very much (2) sometimes (3) hardly ever
398. Tests show that I do best in (1) verbal skills (2) math skills (3) both
399. I was raised in a family as the (1) oldest (or only) (2) in between (3) youngest child

PRINT YOUR NAME IN THE BOXES PROVIDED.
THEN BLACKEN THE LETTER BOX ABOVE WHICH
MATCHES EACH LETTER OF YOUR NAME.

YOUR LAST NAME | FIRST NAME | MI

SOCIAL SECURITY NUMBER

PRINT SOC. SEC. NO. AND
BLACKEN THE NO. BOXES
ABOVE FOR SVIB FORM.
SOC. SEC. NO. AND SEX.

USE NO. 2 PENCIL ONLY
ERASE CHANGES COMPLETELY

I

II

III

IV

V

VI

CAUTION
READ ALL TEN
MARK 3 = Like Most
3 = Like Least
4 = Remaining

VII

VIII

STRONG (SVIB) INFORMATION FORM DATE:_____

Please complete all information. Print carefully or check space

SOC. SEC. #_____. SEX: M___ : F___. AGE_____. DATE OF BIRTH_____

NAME OF SCHOOL LAST ATTENDED_____

MARITAL STATUS: Single____: Married____: Separated____: Widowed____: Divorced____: Remarried____: Other_____.

ARE YOU NOW A STUDENT? Full time____: Part time____: Special student____: No____.

EDUCATIONAL PLANS: No college plans____: Certificate (less than 2 years)____: Associate degree____: Bachelor degree____: Graduate degree____.

COLLEGE MAJOR_____. HOW CERTAIN ARE YOU OF YOUR MAJOR? Very certain____: Fairly certain____: Fairly uncertain____: Very uncertain____.

CURRENT OR HIGHEST EDUCATIONAL LEVEL COMPLETED: HIGH SCHOOL: 9___: 10___: 11___: 12___

HIGH SCHOOL GRADUATE____. HIGH SCHOOL GRADUATE - GED____. VOCATIONAL OR BUSINESS SCHOOL_____

JUNIOR COLLEGE: Frosh.___: Soph.___. FOUR YEAR COLLEGE: Frosh.___: Soph.___: Jr.___: Sr.___

GRADUATE SCHOOL (# of years)_____. WORKING ON _____DEGREE.

HAVE: Bachelor's degree____: Master's degree____: Ph.D. or Ed.D.____: Other_____

DATE OF LAST DEGREE_____.

HIGH SCHOOL RANK PERCENTILE: (Check 1) 90-99%___: 80-89%____: 70-79%____: 60-69%____: 50-59%____: 40-49%____: 30-39%____: 20-29%____: 10-19%____: 0-9%____: Don't know_____

CEEB SCORES: SAT Verbal_____: SAT Math_____: Don't know_____.

ACT SCORES: English_____: Math_____: Soc. Studies_____: Nat. Sci._____: Don't know_____

LIST YOUR VOCATIONAL CHOICES: First_____: Second_____

LIST YOUR CURRENT OCCUPATION:_____. # of years in this field_____

HOW SATISFIED ARE YOU WITH YOUR WORK? Very much____: Satisfied____: Not satisfied____.

LIST YOUR PREVIOUS MOST IMPORTANT JOBS:_____

FAMILY EDUCATIONAL AND EMPLOYMENT BACKGROUNDS:

	TOTAL YEARS OF SCHOOL	DEGREES	OCCUPATION
FATHER	_____	_____	_____
MOTHER	_____	_____	_____
SPOUSE	_____	_____	_____

RACE: (optional) American Indian____: Black____: Caucasian____: Oriental____: Mexican/Spanish American____: Other_____.

INSTRUCTIONS FOR SVIB ANSWER SHEET

Use #2 pencil only! Make only 1 (one) neat mark for each and every question.

Do not mark outside the slot allowed for each question.

PRINT and GRID ALL identification information: Name, Soc. Sec. #, Sex and SVIB Form.

Read ALL directions on SVIB booklet carefully.

(Mismarked answer sheets will not be processed and will be returned for correction at your expense.)

Sample Sam ---------- AUTHORS-R.D.WHETSTONE, R.G.TAYLOR.

YOUR INTEREST PATTERN WAS COMPARED TO THE INTERESTS OF AFA MEN STUDENTS WHO HAVE COMPLETED OVER 80 PERCENT OF THEIR ACADEMIC PROGRAMS. THE HIGHER YOUR SCORE THE MORE SIMILAR YOUR INTEREST PATTERN IS TO THE INTEREST PATTERN OF STUDENTS MAJORING IN THAT AREA. A HIGH SCORE INDICATES THAT THE SUBJECT WOULD BE INTERESTING, BUT NOT NECESSARILY EASY FOR YOU. YOUR HIGHEST SCORES APPEAR ON THE RIGHT. **CAUTION * CAREFULLY INVESTIGATE EACH OF YOUR HIGH MAJOR SCORES BEFORE CHOOSING THE ONE MOST APPROPRIATE FOR YOUR UNIQUE SITUATION. THE MAJORS WITH LOW SCORES ARE PRINTED ON THE LEFT SIDE. YOU SHOWED A STRONG DISLIKE FOR THEM. YOUR RAW SCORES WERE CONVERTED INTO PERCENTILE SCORES WHICH INDICATE HOW MANY STUDENTS OUT OF EACH 100 STUDENTS IN ALL MAJORS SCORED BELOW YOUR SCORES. THE STUDENTS MAJORING IN A SPECIFIC SUBJECT ACHIEVE AN AVERAGE PERCENTILE SCORE OF 90 ON THAT MAJOR SCALE. THE MAJOR SCALES WITH (M) PRECEDING THEM ARE BASED ON A GROUP OF AFA MEN STUDENTS WITH THAT MAJOR.

20 AFA ACADEMIC MAJOR INTEREST SCALE PERCENTILE SCORES (RANKED HIGH TO LOW)

ACTIVE REJECT(1-39)	DISLIKE(40-59)	INDIFFERENT(60-69)	LIKE(70-79)	EXCELLENT CHOICE(80-99)
30 M SCI-BIOLOGICAL	51 M MANAGEMENT	68 M OPERATIONS RESRH	79 M CHEMISTRY	96 M SCI-COMPUTER
*0	48 M HUMANITIES	67 M ENGR-GENERAL	77 M ENGR-SCIENCE	90 M MATHEMATICS
*0	*0	66 M SCI-BEHAVIORAL	75 M INTERNAT.AFFAIRS	86 M ENGR-AERO
*0	*0	64 M ECONOMICS	71 M HISTORY	83 M PHYSICS
*0	*0	61 M SCI-AVIATION	*0	82 M ENGR-ASTRO
*0	*0	61 M ENGR-CIVIL	*0	81 M ENGR-ELECTRICAL
*0	*0	60 M ENGR-MECHANICAL	*0	*0

33 EDUCATIONAL CLUSTER INTEREST SCALES WITH AFA MEN STUDENT PERCENTILE SCORES (AVERAGE= 50)

REALLY DISLIKE(1-19)	DISLIKE(20-39)	AVERAGE(40-59)	LIKE(60-79)	REALLY LIKE(80-99)
19 ACCOUNTING	32 LABORATORY WORK	53 POLITICAL SCIENCE	64 MILITARY ACTIVITY	90 PHYSICAL SCIENCE
14 MUSIC	32 SCIENCE WRITING	*0	64 ENGINEERING	86 PHILOSOPHY
14 PUBLIC SPEAKING	22 CREATIVE WRITING	*0	64 RELIGIOUS ACTIVITY	86 MATHEMATICS
12 DRAMATICS	*0	*0	*0	*0
9 SALES	*0	*0	*0	*0
9 ART	*0	*0	*0	*0
9 SOCIAL SCIENCE	*0	*0	*0	*0
7 TECHNICAL DESIGN	*0	*0	*0	*0
5 FINANCE	*0	*0	*0	*0
5 LANGUAGE/LIT	*0	*0	*0	*0
5 CLERICAL	*0	*0	*0	*0
5 SOCIAL SERVICE	*0	*0	*0	*0
4 JOURNALISM	*0	*0	*0	*0
3 ADMINISTRATION	*0	*0	*0	*0
2 MEDICAL SERVICE	*0	*0	*0	*0
2 MECHANICAL ACTIVITY	*0	*0	*0	*0
1 RECREATION	*0	*0	*0	*0
1 AGRICULTURE	*0	*0	*0	*0
1 ATHLETICS	*0	*0	*0	*0
1 BIOLOGICAL SCIENCE	*0	*0	*0	*0
1 TEACHING	*0	*0	*0	*0
1 OUTDOOR ACTIVITY	*0	*0	*0	*0
1 TECHNICAL SKILLS	*0	*0	*0	*0

LIKE PCT= 27 INDIF.PCT= 6 DISLIKE PCT= 67 YOUR RESPONSES/TOTAL ITEMS=399/399 EDUCATIONAL LEVEL PCTL= 61

APPENDIX B

Career Decision Scale

CAREER DECISION

Marathon Consulting & Press
575 Lofland Road
Columbus, Ohio 43228

Your Name _____ Today's date _____ Your date of birth _____

This questionnaire contains some statements that people commonly make about their educational and occupational plans. Some of the statements may apply to you; others may not. Please read through them and indicate how closely *each* item describes you in your thinking about a career or an educational choice by *circling* the appropriate number on the answer sheet.

If you are excited about going to work and feel no hesitation about it you would circle "4" as it is circled in the example on the next page to indicate the description was exactly the way you feel. If the item is very close, but not exactly the way you feel—for example, you're generally excited about going to work after you graduate, but are experiencing some minor concerns about it—you would circle the number "3". You would circle "2" if the item described you in some ways, but in general it was *more* unlike than like your feelings; for example, if you were generally more concerned than excited about work after graduation. Finally, you would circle "1" if the item did not describe your feelings at all; that is, you were experiencing a great deal of concern and no excitement about graduation and work.

An example is given below:

Sample Self-Description Item	Sample Answer			
	Exactly like me	Very much like me	Only slightly like me	Not at all like me
I am excited about graduating and going to work.	4	3	2	1

If you change your answer, please be sure that all previous marks are completely erased. Please give only one response to each item and respond to all items.

	CIRCLE ANSWER	
	Like Me	Not Like Me
1. I have decided on a career and feel comfortable with it. I also know how to go about implementing my choice.	4 3	2 1
2. I have decided on a major and feel comfortable with it. I also know how to go about implementing my choice.	4 3	2 1
3. If I had the skills or the opportunity, I know I would be a _____ but this choice is really not possible for me. I haven't given much consideration to any other alternatives, however.	4 3	2 1
4. Several careers have equal appeal to me. I'm having a difficult time deciding among them.	4 3	2 1
5. I know I will have to go to work eventually, but none of the careers I know about appeal to me.	4 3	2 1

REMEMBER — 4 is *exactly like me*, 3 is *very much like me*, 2 is *only slightly like me*, and 1 is *not at all like me*.

6. I'd like to be a _____ but I'd be going against the wishes of someone who is important to me if I did so. Because of this, it's difficult for me to make a career decision right now. I hope I can find a way to please them and myself.	4	3	2	1
7. Until now, I haven't given much thought to choosing a career. I feel lost when I think about it because I haven't had many experiences in making decisions on my own and I don't have enough information to make a career decision right now.	4	3	2	1
8. I feel discouraged because everything about choosing a career seems so "iffy" and uncertain; I feel discouraged, so much so that I'd like to put off making a decision for the time being.	4	3	2	1
9. I thought I knew what I wanted for a career, but recently I found out that it wouldn't be possible for me to pursue it. Now I've got to start looking for other possible careers.	4	3	2	1
10. I want to be absolutely certain that my career choice is the "right" one, but none of the careers I know about seem ideal for me.	4	3	2	1
11. Having to make a career decision bothers me. I'd like to make a decision quickly and get it over with. I wish I could take a test that would tell me what kind of career I should pursue.	4	3	2	1
12. I know what I'd like to major in, but I don't know what careers it can lead to that would satisfy me.	4	3	2	1

REMEMBER — 4 is exactly like me. 3 is *very much like me.* 2 is *only slightly like me.* and 1 is *not at all like me.*

13. I can't make a career choice right now because I don't know what my abilities are.	4	3	2	1
14. I don't know what my interests are. A few things "turn me on" but I'm not certain that they are related in any way to my career possibilities.	4	3	2	1
15. So many things interest me and I know I have the ability to do well regardless of what career I choose. It's hard for me to find just one thing that I would want as a career.	4	3	2	1
16. I have decided on a career, but I'm not certain how to go about implementing my choice. What do I need to do to become a _____ anyway?	4	3	2	1
17. I need more information about what different occupations are like before I can make a career decison.	4	3	2	1
18. I think I know what to major in, but feel I need some additional support for it as a choice for myself.	4	3	2	1

19. None of the above items describe me. The following would describe me better: (write your response below).

APPENDIX C

My Academic Situation Questionnaire

MY ACADEMIC SITUATION

NAME_____ M____ F____ AGE_____

List of all the academic majors you are considering right now:

_____

_____

_____

_____

Try to answer the following statements as mostly TRUE or mostly FALSE. Choose the answer that best represents your present opinion.

In thinking about your present academic major or in planning to select an academic major:

1. I need reassurance that I have made the right choice of major. T F
2. I am concerned that my present interests may change over the years. T F
3. I am uncertain about the academic majors I could perform well. T F
4. I don't know what my major academic strengths and weaknesses are. T F
5. The academic major I really want is not offered at the Academy. T F
6. If I had to select an academic major right now, I am afraid I would make a bad choice. T F
7. I need to find out what kind of academic major I should select. T F
8. Making up my mind about an academic major has been a long and difficult problem for me. T F
9. I am confused about the whole issue of selecting an academic major. T F
10. I am not sure that my present choice of academic major is right for me. T F
11. I don't know enough about what cadets do in the various academic majors. T F
12. No single academic major appeals strongly to me. T F
13. I am uncertain about the academic major I would enjoy. T F
14. I would like to increase the number of academic majors I could consider. T F

15. My estimates of my abilities and talents vary a lot from year to year. T

16. I am not sure of myself in many academic areas. T

17. I have known what academic major I wanted for less than one year. T

18. I can't understand how some people can be so set about what they want to major in. T

19. I need the following information: Circle "Yes" or "No".

    a. How to select an academic major. Y

    b. What types of cadets enter different academic majors. Y

    c. More information about academic majors. Y

    d. What type of background should a cadet have to select a certain academic major. Y

Other_____

_____

20. I have the following difficulties: Circle "Yes" or "No".

    a. I am uncertain about my ability to finish the necessary education or training. Y

    b. I lack the special talents to pursue my first academic choice. Y

    c. An influential person in my life does not approve of my choice of academic majors. Y

Anything else_____

_____

_____

APPENDIX D

My Academic Behavior Checklist

MY ACADEMIC BEHAVIOR

1. NAME _____

2. MOST LIKELY OR REASONABLE MAJOR:

_____

3. HOW SATISFIED ARE YOU WITH YOUR PRESENT CHOICE OF A MAJOR?

____ Well satisfied
____ Moderately satisfied
____ Dissatisfied but intent to remain
____ Dissatisfied and intend to change
____ Undecided about major

4. DO YOU FEEL THAT YOU NEED TO TALK TO A COUNSELOR ABOUT YOUR ACADEMIC MAJOR EXPLORATION?

Immediately	Within next week	Within next month	Within next 2 months	No need

DURING THIS SEMESTER, HOW MUCH OF THE FOLLOWING DID YOU DO?

Read each item. Then answer, How many times? Your answer may be approximate.

Example:

Talking to an instructor about academic majors

a. Reading academic information in the career library.

b. Sending for brochures or handouts on acdemic majors.

c. Interviewing a faculty member about possible academic majors.

d. Thinking about specific academic jajors.

e. Talking to an academic advisor about your academic plans.

f. Talking to your parents or relatives about your academic plans.

g. Thinking about what major would be best for me.

h. Talking with other students about your academic plans or what to major in.

APPENDIX E

Academic Information Request Card

Please send me information on the following majors:

Name _____ CWDS-_____

Forward this card to the Cadet Counseling Center (DFBLC), Room 2C14, Vandenberg Hall

APPENDIX F

Vocational Preference Inventory

THE VOCATIONAL PREFERENCE INVENTORY

Developed by John L. Holland, Ph.D.

This is an inventory of your feelings and attitudes about many kinds of work. Fill out your answer sheet by following the directions given below:

1. Show on your answer sheet the occupations which *interest* or *appeal* to you by blackening Y for "Yes."
2. Show the occupations which you *dislike* or find *uninteresting* by blackening N for "No."
3. Make *no marks* when you are undecided about an occupation.

---

1. Criminologist
2. Private Investigator
3. Restaurant Worker
4. Detective
5. Photoengraver
6. Truck Gardener
7. Physical Education Teacher
8. Humorist
9. Photographer
10. Diplomat

11. Airplane Mechanic
12. Meteorologist
13. Sociologist
14. Bookkeeper
15. Speculator
16. Poet
17. Deep Sea Diver
18. Stock Clerk
19. Dramatic Coach
20. Lawyer

21. Fish and Wildlife Specialist
22. Biologist
23. High School Teacher
24. Business Teacher
25. Buyer
26. Symphony Conductor
27. Wrecker (Building)
28. Veterinarian
29. Elementary School Teacher
30. Physician

31. Auto Mechanic
32. Astronomer
33. Juvenile Delinquency Expert
34. Budget Reviewer
35. Advertising Executive
36. Musician
37. Prizefighter
38. Post Office Clerk
39. Experimental Laboratory Engineer
40. Bartender

41. Carpenter
42. Medical Laboratory Technician
43. Speech Therapist
44. Certified Public Accountant
45. Manufacturer's Representative
46. Author
47. Firefighter
48. Airline Ticket Agent
49. Entertainer
50. Novelist

51. Power Shovel Operator
52. Anthropologist
53. Marriage Counselor
54. Credit Investigator
55. Television Producer
56. Commercial Artist
57. Wild Animal Trainer
58. Administrative Assistant
59. Physical Therapist
60. Cashier

61. Surveyor
62. Zoologist
63. School Principal
64. Court Stenographer
65. Hotel Manager
66. Free-Lance Writer
67. Stunt Man/Stunt Woman (Movies)
68. Route Salesperson
69. Professional Athlete
70. Flight Attendant

71. Construction Inspector
72. Chemist
73. Playground Director
74. Bank Teller
75. Business Executive
76. Musical Arranger
77. Jockey
78. Interior Decorator
79. Airplane Pilot
80. Banker

THE VOCATIONAL PREFERENCE INVENTORY (Continued)

81. Radio Operator
82. Independent Research Scientist
83. Clinical Psychologist
84. Tax Expert
85. Restaurant Manager
86. Journalist
87. Motorcycle Driver
88. Department Store Manager
89. Referee (Sporting Events)
90. Mail Carrier

91. Filling Station Worker
92. Writer of Scientific Articles
93. Social Science Teacher
94. Inventory Controller
95. Master of Ceremonies
96. Portrait Artist
97. Blaster (Dynamiter)
98. Police Officer
99. English Teacher
100. U.N. Official

101. Tree Surgeon
102. Editor of a Scientific Journal
103. Director of Welfare Agency
104. IBM Equipment Operator
105. Salesperson
106. Concert Singer
107. F.B.I. Agent
108. Probation Agent
109. Astronaut
110. College Professor

111. Long Distance Bus Driver
112. Geologist
113. Youth Camp Director
114. Financial Analyst
115. Real Estate Salesperson
116. Composer
117. Mountain Climber
118. Cook/Chef
119. Stage Director
120. Ticket Agent

121. Locomotive Engineer
122. Botanist
123. Personal Counselor
124. Cost Estimator
125. Publicity Director
126. Sculptor/Sculptress
127. Explorer
128. Nursery School Teacher
129. Quality Control Expert
130. Judge

131. Machinist
132. Scientific Research Worker
133. Psychiatric Case Worker
134. Payroll Clerk
135. Sports Promoter
136. Playwright
137. Test Pilot
138. Computer Programmer
139. Clothing Designer
140. Truck Driver

141. Electrician
142. Physicist
143. Vocational Counselor
144. Bank Examiner
145. Sales Manager
146. Cartoonist
147. Racing Car Driver
148. Forester
149. Social Worker
150. Sales Clerk

151. Funeral Director
152. Mind Reader
153. Architect
154. Shipping & Receiving Clerk
155. Criminal Psychologist
156. Insurance Clerk
157. Barber
158. Bill Collector
159. Ward Attendant
160. Masseur/Masseuse

CONSULTING PSYCHOLOGISTS PRESS
577 College Avenue, Palo Alto, California 94306

Name . . . . . Sex . . . Age . . . Date . . . . . .

Occupation . . . . . Major Field . . . . . .

1 2 3 4 5 6 7 8 9 10 Inf 11 Ac

Blacken "Y" for Yes, or "N" for No. For example, ✓ or ✗

1 Y N	11 Y N	21 Y N	31 Y N	41 Y N	51 Y N	61 Y N	71 Y N	81 Y N	91 Y N	101 Y N	111 Y N	121 Y N	131 Y N	141 Y N	151 Y N
2 Y N	12 Y N	22 Y N	32 Y N	42 Y N	52 Y N	62 Y N	72 Y N	82 Y N	92 Y N	102 Y N	112 Y N	122 Y N	132 Y N	142 Y N	152 Y N
3 Y N	13 Y N	23 Y N	33 Y N	43 Y N	53 Y N	63 Y N	73 Y N	83 Y N	93 Y N	103 Y N	113 Y N	123 Y N	133 Y N	143 Y N	153 Y N
4 Y N	14 Y N	24 Y N	34 Y N	44 Y N	54 Y N	64 Y N	74 Y N	84 Y N	94 Y N	104 Y N	114 Y N	124 Y N	134 Y N	144 Y N	154 Y N
5 Y N	15 Y N	25 Y N	35 Y N	45 Y N	55 Y N	65 Y N	75 Y N	85 Y N	95 Y N	105 Y N	115 Y N	125 Y N	135 Y N	145 Y N	155 Y N
6 Y N	16 Y N	26 Y N	36 Y N	46 Y N	56 Y N	66 Y N	76 Y N	86 Y N	96 Y N	106 Y N	116 Y N	126 Y N	136 Y N	146 Y N	156 Y N
7 Y N	17 Y N	27 Y N	37 Y N	47 Y N	57 Y N	67 Y N	77 Y N	87 Y N	97 Y N	107 Y N	117 Y N	127 Y N	137 Y N	147 Y N	157 Y N
8 Y N	18 Y N	28 Y N	38 Y N	48 Y N	58 Y N	68 Y N	78 Y N	88 Y N	98 Y N	108 Y N	118 Y N	128 Y N	138 Y N	148 Y N	158 Y N
9 Y N	19 Y N	29 Y N	39 Y N	49 Y N	59 Y N	69 Y N	79 Y N	89 Y N	99 Y N	109 Y N	119 Y N	129 Y N	139 Y N	149 Y N	159 Y N
10 Y N	20 Y N	30 Y N	40 Y N	50 Y N	60 Y N	70 Y N	80 Y N	90 Y N	100 Y N	110 Y N	120 Y N	130 Y N	140 Y N	150 Y N	160 Y N

educational research associates

APPENDIX G

Means and Standard Deviations for Outcome Measures by Class, Treatment and Personality Type

Means and Standard Deviation for Measures of Information Seeking Behavior, Pre, Post and Follow-up by Treatment Mode, Class and Personality Type

	Pre M	SD	Post M	SD	Follow-up M	SD
Class						
Freshmen	33.13	20.65	45.33	21.42	40.51	22.31
Sophomores	37.07	20.63	45.26	23.94	25.62	22.85
Treatment						
Individual	30.40	13.20	46.66	17.62	31.22	21.14
Audio Tape	34.8	22.92	47.02	22.99	33.83	27.85
Profile only	39.83	22.80	48.01	25.66	31.02	20.00
Control	36.90	22.99	40.69	24.23	36.19	21.48
Type						
People Oriented	41.67	23.33	50.29	23.89	35.63	23.82
Task Oriented	32.10	17.60	42.85	20.50	30.98	21.45

Means and Standard Deviation for Measures of Academic Certainty, Pre, Post and Follow-up by Treatment Mode, Class and Personality Type

	Pre		Post		Follow-up	
	M	SD	M	SD	M	SD
Class						
Freshmen	2.35	.90	2.38	.92	3.28	.80
Sophomores	3.04	.83	3.39	.78	3.60	.61
Treatment						
Individual	2.55	.81	2.91	.82	3.37	.70
Audio Tape	2.92	.75	3.10	.66	3.50	.64
Profile only	2.90	.83	2.88	.83	3.60	.60
Control	2.52	.97	2.71	1.00	3.37	.84
Type						
People Oriented	2.65	.72	2.82	.80	3.48	.66
Task Oriented	2.76	.85	2.93	.83	3.44	.70

Means and Standard Deviation for Measures of Academic Identity, Pre, Post and Follow-up by Treatment Mode, Class and Personality Type

	Pre		Post		Follow-up	
	M	SD	M	SD	M	SD
Class						
Freshmen	7.16	3.81	7.04	3.90	4.29	3.61
Sophomores	5.64	3.92	4.78	3.84	3.43	3.39
Treatment						
Individual	6.05	3.74	5.34	3.64	3.85	3.43
Audio Tape	6.12	3.37	5.80	4.22	4.03	3.66
Profile only	6.93	3.93	6.55	4.05	3.68	3.42
Control	6.41	4.19	6.07	4.05	3.83	3.48
Type						
People Oriented	7.40	3.95	6.74	4.25	4.60	3.84
Task Oriented	5.81	3.60	5.52	3.69	3.45	3.22

Means and Standard Deviation for Measures of the Need for Academic Information, Pre, Post and Follow-up by Treatment Mode, Class and Personality Type

	Pre		Post		Follow-up	
	M	SD	M	SD	M	SD
Class						
Freshmen	3.06	1.20	2.30	1.48	.76	1.30
Sophomores	1.50	1.47	1.06	1.33	.43	1.04
Treatment						
Individual	2.18	1.38	1.70	1.37	.51	1.01
Audio Tape	2.42	1.34	1.63	1.46	.75	1.35
Profile only	2.51	1.35	1.59	1.53	.51	1.14
Control	2.06	1.29	1.79	1.38	.62	1.14
Type						
People Oriented	2.49	1.34	2.02	1.56	.73	1.37
Task Oriented	2.17	1.35	1.47	1.37	.48	.91

Means and Standard Deviation for Measures Environmental or Personal Barriers, Pre, Post and Follow-up by Treatment Mode, Class and Personality Type

	Pre		Post		Follow-up	
	M	SD	M	SD	M	SD
Class						
Freshmen	.33	.54	.33	.56	.28	.52
Sophomores	.43	.70	.31	.54	.38	.65
Treatment						
Individual	.31	.58	.28	.52	.30	.55
Audio Tape	.26	.50	.18	.39	.28	.51
Profile only	.48	.58	.43	.70	.40	.64
Control	.45	.68	.41	.53	.35	.60
Type						
People Oriented	.56	.70	.42	.55	.38	.51
Task Oriented	.28	.50	.27	.52	.31	.58

Means and Standard Deviation for Measures of Satisfaction with Major Choice, Pre, Post and Follow-up by Treatment Mode, Class and Personality Type

	Pre		Post		Follow-up	
	M	SD	M	SD	M	SD
Class						
Freshmen	3.67	1.72	3.42	1.78	1.69	1.04
Sophomores	2.25	1.56	1.55	1.03	1.38	.76
Treatment						
Individual	2.90	1.50	2.34	1.48	1.52	.80
Audio Tape	2.73	1.66	2.28	1.11	1.35	.46
Profile only	2.96	1.68	2.52	1.16	1.40	.79
Control	3.18	1.77	2.86	1.61	1.78	1.15
Type						
People Oriented	3.01	1.54	2.58	1.30	1.56	.81
Task Oriented	2.93	1.71	2.44	1.33	1.50	.77

Means and Standard Deviation for Measures of the Number Majors being considered, Pre, Post and Follow-up by Treatment Mode, Class and Personality Type

	Pre M	SD	Post M	SD	Follow-up M	SD
Class						
Freshmen	3.05	1.28	2.97	1.27	1.86	1.01
Sophomores	2.19	1.03	1.72	.93	1.21	.59
Treatment						
Individual	2.53	1.06	2.52	1.20	1.51	.90
Audio Tape	2.28	1.00	2.15	.91	1.63	.85
Profile only	2.97	1.27	2.41	1.02	1.51	.73
Control	2.71	1.27	2.32	1.22	1.54	.79
Type						
People Oriented	2.64	1.04	2.32	.96	1.62	.82
Task Oriented	2.61	1.22	2.36	1.11	1.48	.72

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